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SPECIAL ARTICLE.

MEDICAL DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA.

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THE history of the oldest medical school in the United States carries us back to a time when the people of this country still exhibited the punctilious attention to matters of politeness and courtesy which prevailed before the

perform not only the duties of an assistant, in preparing medicines and keeping records, but also those of a drudge in carrying these medicines from house to house and in cleaning up their master's offices and doing other menial services. Of public teaching there had been nothing but a course of lectures in anatomy delivered in Philadelphia by Dr. Thomas Cadwalader about 1750, and another delivered several years later by William Hunter in Newport, R. I., and still later a third given by Dr. William Shippen, Sr., in Philadelphia.

In 1765 John Morgan, a member of the first class that graduated in arts from the College



MEDICAL DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA.

printing press, the steam-engine and the various applications of electricity combined to give this country a peculiar character of haste and strenuous exertion. That was the age of canes and perukes, of formal manners, of respect for authority, and deference to age, of many graceful traits which have almost disappeared in the bustle and hurry of our day.

Before the organization of the Medical Department of the University of Pennsylvania in 1765, the only form of medical instruction in this country was that furnished by individual practitioners to whom were apprenticed such youths as desired to enter upon their calling, and who were sometimes compelled to

of Philadelphia, in 1757, and who had received his medical education abroad, returned to this country and proposed the addition of a school of medicine to his Alma Mater. His project, which was endorsed by the Proprietary of the Province, Thomas Penn, and by eminent teachers of medicine in England, met with a favorable reception by the Trustees of the College, and a department of medicine was inaugurated by his election May 3, 1765, as Professor of the Theory and Practice of Physic, while on September 23d, of the same year, Dr. William Shippen, Jr., a graduate of the College of New Jersey, who like Morgan had studied medicine abroad, and had there conferred with

Morgan about the foundation of a medical school in Philadelphia, was made Professor of Anatomy, Surgery and Midwifery.

At the same time Dr. Thomas Bond delivered a regular course of lectures in the Pennsylvania Hospital, attendance upon which was made obligatory upon the students, part of the requirements for the Degree of Bachelor of Medicine, established by vote of the trustees July 27, 1767, being that the applicant should attend one course of "Clinical Lectures," and the "Practice of the Pennsylvania Hospital for one year." This was in addition to furnishing evidence of a good classical and scientific education and attendance on lectures on chemistry in the College.

In January, 1768, the medical faculty was enlarged by the addition to it of Dr. Adam Kuhn, as Professor of *Materia Medica* and Botany, and in July, 1769, Dr. Benjamin Rush was appointed Professor of Chemistry. Thus the Faculty was made up of men of the highest type of citizens, as men of science and as teachers, each one of whom left an indelible impress upon the development of medical teaching in this country.

At that time, and for long afterward, Philadelphia was the undisputed center of education in America, and Philadelphia physicians and surgeons surpassed those of the rest of the country in number and attainments and reputation. In this, the medical profession in Philadelphia was only keeping step with the other departments of art, science, and industry, for here were established the first medical school, the first hospital, and the first dispensary in America, the first fire company, the first circulating library, the first company for insurance against fire, the first local periodical, and the first bank; while in Colonial times and long afterward Philadelphia was the center of study for botany, astronomy, natural history, and all the sciences that were pursued at that age. Philadelphia also furnished the material to form the American Philosophical Society, which for many years was to our country very much what the French Academy has been to France—the focus of learning of every sort. The College of Philadelphia (afterwards the University of Pennsylvania) enjoyed the public recognition of the highest officials of the British Government before the War of the Revolution, and to its halls were gathered, from all parts of the country and even from foreign lands, students who sat at the feet of teachers who were the honored and equal colleagues of the most eminent scientific men of Europe—the often-quoted sneer of Sidney Smith in regard to American achievements in science and art being founded upon his ignorance as much as upon his spleen.

It is hard now to picture to ourselves the conditions which existed in Philadelphia at the end of the eighteenth century: the strip of houses along the Delaware, the smallness of

those houses, the unlighted streets, the want of public conveyances, the watchmen strolling sleepily through the town at night, and greeting from time to time the doctor, wrapped in his cloak and supported by his cane, as he went on his errands of mercy, and to realize the state of the country at a time when its only original work on surgery was that of John Jones of Philadelphia, entitled: "Plain, Concise and Practical Remarks on the Treatment of Wounds and Fractures"—a little book put out in 1776 for the use of surgeons in the armies of the Colonies—and when Shippen's house was attacked by what is known in history as the "Sailors' Mob," and he was compelled to deny in print the accusations of grave-robbing.

The general standing of the College of Philadelphia at this time may be inferred from the fact that in 1763 its students numbered nearly four hundred and were gathered from different parts of the Colonies as well as from the West Indies and other adjacent provinces and islands. The establishment of the department of medicine was the occasion for the expression by Dr. Morgan of the following hope which was abundantly fulfilled when it became not only the special glory of the University, but also the greatest school of medicine in the country: "Perhaps this Medical Institution, the first of its kind in America, though small in the beginning, may receive a constant increase of strength, and annually exert new vigor. It may collect a number of young persons, of more than ordinary abilities, and so improve their knowledge as to spread its reputation to distant parts. By sending these abroad duly qualified, or by exciting an emulation amongst men of parts and literature, it may give birth to other useful institutions of a similar nature, or occasional rise, by its example, to numerous societies of different kinds, calculated to spread the light of knowledge through the whole American Continent, wherever inhabited."

The outbreak of the war between the Colonies and the mother country seriously interrupted the course of teaching in the College of Philadelphia, partly because fewer persons presented themselves to be taught—so many having joined the army—and partly because the teachers of the institution themselves took an active part in the struggle and gave their services to their country: all of the four professors who began the work of teaching—Morgan, Shippen and Rush—being attached to the Continental Army as medical officers. In the year 1779 the party in power in the new State of Pennsylvania, for reasons which cannot now be either understood or justified, passed an Act annulling the charter of the College of Philadelphia and organized an institution to which was given the name of "The University of the State of Pennsylvania." This act of injustice did not

destroy the vitality of the College or secure prosperity for its intended supplanter; and in 1789 the Legislature restored the rights of the College of Philadelphia and declared its previous action to have been "repugnant to justice and a violation of the Constitution of this Commonwealth and dangerous in every precedent to all incorporated bodies." Two years after this the institution which had been meant to supplant the College of Philadelphia proposed to merge its existence in that of its predecessor and on September 30, 1791, the two were united by the Legislature and made into one institution to be carried forward under the title of the "University of Pennsylvania."

When the struggle of the Revolution was ended and the work of organizing and solidifying the affairs of the Colonies was progressing,

the Faculty the teaching of anatomy was freed from the burden of instruction in surgery and in midwifery, the latter of which was generally regarded as rather demeaning to a medical man, and all three branches were endowed with greater dignity. It is a curious indication of the sentiment of the time that when James was appointed Professor of Midwifery, the Trustees provided that it was not necessary, in order to obtain a degree, that the students should attend his lectures. In 1813, however, the Chair of Midwifery was placed on an equal footing with the other Chairs of the Faculty.

Of its first teachers, posterity has preserved the liveliest recollection. John Morgan, who shared with Shippen the glory of having founded the Department of Medicine, conducted the duties of his Chair until his patriot-



UNIVERSITY, COLLEGE AND MEDICAL HALLS.

the Medical Department of the University of Pennsylvania increased in scope, so that in 1792 its Faculty consisted of William Shippen, Jr., Professor of Anatomy, Surgery and Midwifery, with Caspar Wistar as Adjunct; Adam Kuhn, Professor of the Theory and Practice of Medicine; Benjamin Rush, Professor of the Institutes of Medicine and Clinical Medicine; James Hutchinson, Professor of Chemistry; Samuel P. Griffiths, Professor of Materia Medica and Pharmacy; and Benjamin Smith Barton, Professor of Botany and Natural History. The year 1805 was remarkable in the history of the University by the establishment of a separate chair for the teaching of surgery, to which was appointed Dr. Philip Syng Physick, while in 1810 Thomas Chalkley James was made Professor of Midwifery. By these two additions to

ism led him, with many of his colleagues, to place his skill at the service of his country. At the end of the Revolutionary War he did not return to his professorial position on account of failing health.

More happy in his career, Shippen was for over forty years a professor in the University, teaching at first the then allied subjects of anatomy, surgery and midwifery—which in that day was a department of surgery—and concluding as Professor of Anatomy when this branch was considered worthy of the best efforts of a single teacher. Shippen did more than any other man in this country to induce a proper consideration for the subject of midwifery. As early as 1765 he had established a course of private lectures in which he proposed "to instruct those women who have virtue

enough to own their ignorance and apply for instruction, as well as those young gentlemen now engaged in the study of that useful and necessary branch of surgery, who are taking pains to qualify themselves to practise in different parts of the country, with safety and advantage to their fellow citizens." His career as an anatomist, however, overshadowed his other worthy achievements. He combined great ability as an anatomist with a singularly pleasing and successful method of instruction, so that those of his pupils who had studied abroad declared that they had met no man superior as a demonstrator of anatomy and very few indeed who were his equals.

It is hard to think of the name of Benjamin Rush without recalling the majestic figure he became, or to fancy him a graduate of the College of New Jersey at the age of sixteen years, a student in the office of the eminent Dr. Redman of Philadelphia, and returning from studies in Edinburgh, where he received the degree of Doctor of Medicine, to occupy when only twenty-four years old the Chair of Chemistry in the College of Philadelphia—the first Chair of Chemistry established in North America. He brought with him the endorsement of Thomas Penn, who wrote that Dr. Rush had been recommended to him by Dr. Fothergill as a "very expert Chymist" and added "the Doctor having further recommended to me to send a Chymical Apparatus to the College, as a Thing that will be of great use, particularly in the tryal of ores, I send you such as Dr. Fothergill thought necessary, under the care of Dr. Rush, which I desire your acceptance of." Youngest of the members of the Faculty, whose ages ranged from twenty-four to thirty-four years, Rush became the greatest of them all, adding to a position as a teacher, which has led to his being called the Galen of America, extraordinary services as a public man, as surgeon-general to the Continental Armies, as Member of Congress and as a signer of the Declaration of Independence. So wide did his fame extend that in 1811 the Emperor of Russia sent him a diamond ring as a testimonial of respect, while in this country he was so great that no man of his time or since can be compared with him as a medical teacher. Indeed, in our day it is hard to understand those days in which a man was so much a master of his followers. And yet he did not escape detraction, for one of his enemies, taking the sobriquet of "Peter Porcupine," issued, from the security of New York, a periodical which he named the "Rush Light," devoted solely to bitter abuse of him.

James Hutchinson, a graduate in arts of the College of Philadelphia, took his degree of Bachelor of Medicine there in 1774. His tickets to the lectures of the Professors of the College, which are still in the possession of his descendants, were written upon the backs of playing cards. After studying in England he

returned to America by way of France bearing important dispatches from Franklin to the Congress of the United States. When near the American coast the ship in which he was a passenger was chased by a British armed vessel and, to save the dispatches, he left the ship and in an open boat under a heavy fire succeeded in landing with his precious documents intact. The ship was soon captured and he lost everything he had on it, including a fine medical library collected in England and in France. To this service to his country he added the evidence of patriotism then usual in the medical profession, that he served in the Continental Army as a medical officer and as a volunteer, and afterwards in the State Navy, for the handsome remuneration of at first three shillings per day and finally for the magnificent sum of three or four pence.

Samuel Powell Griffiths, who lectured only six sessions and then resigned, was largely influential in the establishment of the Philadelphia Dispensary in 1786, and interested in the formation of a National Pharmacopœia, projected in 1778 by the College of Physicians of Philadelphia and finally brought to accomplishment in 1820.

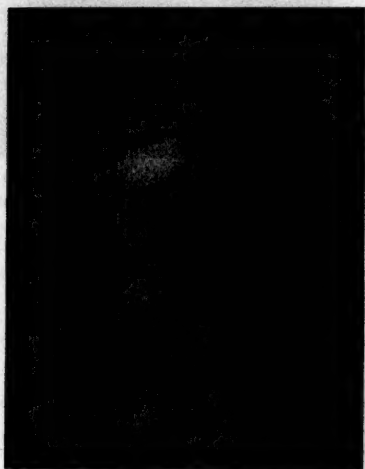
Benjamin Smith Barton was the pioneer of the science of botany in America, not only distinguished himself, but also followed by a number of distinguished disciples. In teaching he had the advantage of being skilful with his pencil in illustrating his subject—an art which he acquired under the instruction of Major André, when he was a prisoner of war at Lancaster where Barton was born.

Caspar Wistar was one of the most attractive and influential men of his period. He was a disciple of John Redman and John Jones—then practising surgery in Philadelphia—a graduate in medicine of the University of the State of Pennsylvania and trained abroad. He taught first chemistry and then anatomy in the reinstated College of Philadelphia. He had rare skill as a teacher and was singularly inventive in methods of demonstration to the students, and in preparing specimens and models which are still used. His anatomical preparations, presented to the University by his widow, supplemented in 1824 by the anatomical collection of the Pennsylvania Hospital which was given by the Managers to the University, and at a later date by the preparations of Dr. Horner, constituted what was for nearly a century known as the Wistar and Horner Museum and was the scientific foundation of the present Wistar Institute of Anatomy and Biology, which is now such an important department in the University.

Thomas Chalkley James, the first actual professor of obstetrics in this country, was one of the earliest graduates in medicine from the college in which he afterward became a teacher. During his studies abroad he was associated with Physick, afterward his colleague

in the University. As a young man, in 1794, he joined those who lent their aid to Washington in suppressing a disturbance known in history as the "Whiskey Insurrection," which at that time seriously threatened the existence and stability of the newly formed republic. He joined the expedition as surgeon of a *corps d'élite*, which promptly tendered its services at the request of the President. As these volunteer troops marched before Washington on their way to the scene of the conflict, he was heard to say with emotion: "God bless you! God bless you, young gentlemen!" James was largely influential in having established at the Philadelphia Almshouse, in 1802, a lying-in ward, to which he was the first accoucheur; he was also, in 1810, made the first "Physician to the Lying-in Department" in the Pennsylvania Hospital, part of the funds for the establishment of which were contributed in 1807 by the gallant and patriotic young gentlemen of Philadelphia

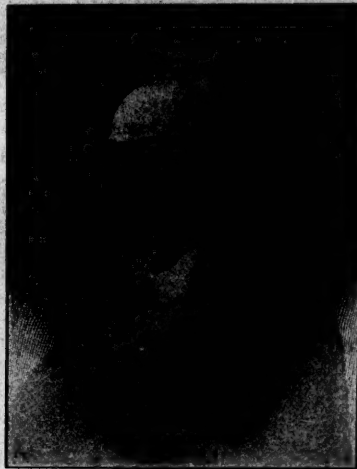
Treatise upon the Blood, awards to Physick the credit of many of the experiments therein described. He received the degree of Doctor of Medicine at Edinburgh in 1792: this occurrence being the occasion of a mark of singular appreciation by the University of Edinburgh to the standing of the University of the State of Pennsylvania in which he had received his medical training under Dr. Kuhn and his colleagues. As surgeon to the Pennsylvania Hospital he delivered private lectures on surgery as early as 1800, and in 1810 he was elected by the University of Pennsylvania to fill the Chair of Surgery which was then first separated from that of Anatomy. Physick's achievements as a surgeon and as a teacher fill a large part of the history of his day. He enjoyed the acquaintance and confidence of the most distinguished men of his time and one of his last operations was a successful lithotomy upon Chief Justice Marshall, then in his seventy-fifth year.



JOHN MORGAN.

who constituted the "First Troop of City Cavalry," an organization still in existence and enjoying the prerogative of being body-guard to the President of the United States whenever he visits this State. The members of the Troop gave to the Hospital the entire amount of their pay—long withheld—for services rendered their country during the Revolutionary War, and the interest on this sum amounted annually to between four and five hundred dollars.

Of the men who during the nineteenth century taught in the halls of the University and added to its luster, one of the most conspicuous was Philip Syng Physick, who by his combination of talents and integrity well merited the title of "Father of American Surgery." While studying in Great Britain he was a favorite pupil of John Hunter, who, in his



WILLIAM SHIPPEN, JR.

The perpetuation of Physick's reputation depends largely upon the recollections of his pupils and especially of his nephew, John Syng Dorsey, who founded much of the teaching of his Treatise on Surgery upon the practice of Physick. Dorsey was made adjunct Professor of Surgery when only twenty-four years old and soon after a surgeon to the Pennsylvania Hospital. His intimate association with Physick furnished an opportunity of which his genius enabled him to make good use, so that in 1813 he published his *Elements of Surgery*, which was the first work on general surgery issued in this country and for a long time the only text-book on surgery used in American schools. His death took place in 1818 when he was only thirty-five years of age, within a week after he had delivered his opening lecture as Professor of Anatomy, and brought to

an end a career which in its promise and untimely end suggests that of Bichat. A short time before his death Dorsey removed to a newly built house on the southwest corner of Seventh and Walnut streets, which overlooked what is now known as Washington Square and was then the Potter's Field. On the eastern side of this field was the city



ANATOMICAL HALL IN 1770.

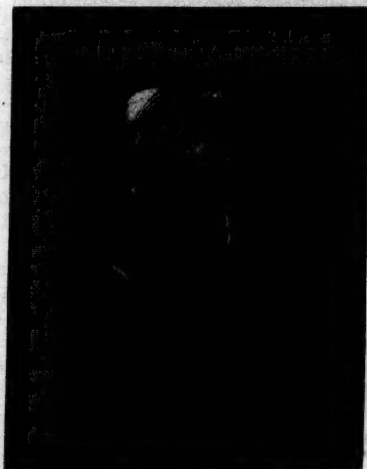
prison, referred to in the annals of that day. He had been in the house but a few days when Judge Peters, an old and intimate friend, called to pay his respects. Standing at the window over-looking the Square, with the prison full in sight, he said: "Dorsey, I do not like your situation; you have a poor prospect before the grave." Another humorous saying connected with the life of Dorsey is attributed to Nathaniel Chapman, who, in reply to some expression of gratification by Dorsey on his appointment as Professor of Anatomy, and the remark that he hoped he would have an opportunity to distinguish himself, said: "Why you are already distinguished, a muscle has been named for you—the *latissimus dorsi*."

During the remainder of the nineteenth century the roll of Professors in the Medical Department, of the University of Pennsylvania included the names of the brilliant and versatile Nathaniel Chapman, who after assisting Professor James in the teaching of midwifery was Professor of Materia Medica and then for thirty-four years Professor of the Theory and Practice of Medicine, whose remarkable witticisms served perhaps as much as his ability as practitioner and as a teacher to keep his memory green for generations; of George B. Wood, fifteen years Professor of Materia Medica and ten years Professor of Practice, teacher, trustee, historian and benefactor; of Alfred Stillé, who filled the Chair of Practice from 1864 to 1884, of world-wide reputation as a teacher and author and a man of the highest type of scholarship and refinement.

Stillé's successor in the Chair of Practice

was William Pepper, Jr., whose extraordinary talents and unwearied perseverance, in that chair and in the office of Provost of the University, enabled him to greatly expand the field of its usefulness, whose capabilities were Napoleonic, and whom no obstacle sufficed to deter from pursuing to its end any work that he undertook. Toward the end of his life his administrative ability was more conspicuous than his achievements in the line of his profession, but no one who knew him well is at a loss to understand why he occupied so conspicuous a position before the medical profession or before the world.

In the teaching of surgery and anatomy the most memorable names were those of William Gibson, William E. Horner, Joseph Leidy and D. Hayes Agnew. Gibson, who left the Chair of Surgery in the University of Maryland and occupied the corresponding one in the University of Pennsylvania for thirty-six years, is best known by his work on Surgery, which passed through many editions, and the fact that he twice successfully performed Cesarean section upon the same patient. Horner, coming from Virginia, was assistant to Physick and afterward to Dorsey, then, in 1820, Adjunct Professor of Anatomy, and at the resignation of Physick, Professor—a careful, studious and painstaking teacher and an able surgeon, author of a work on Anatomy and contributor of so many specimens to the Museum founded by Wistar that by order of the

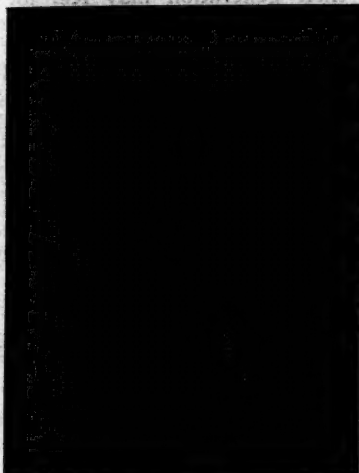


BENJAMIN RUSH.

Trustees it was known after his death as the Wistar and Horner Museum.

Next after Gibson, Henry H. Smith filled the Chair of Surgery for fourteen years, being followed by D. Hayes Agnew, who occupied it from 1871 to 1889—one of the most loved teachers in the Faculty and a surgeon of extraordinary judgment and skill, on whose

words the Nation hung during the weary months in 1881 when President Garfield languished to death from the bullet of an assassin. Though he published a work on Surgery that filled three large volumes, his most lasting monument is the magnificent D. Hayes Agnew Pavilion of the University Hospital, erected by his friends and pupils in his memory. And last—before the present incumbent



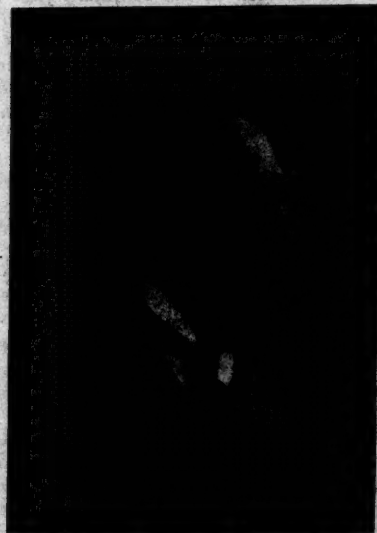
PHILIP SYNG PHYSICK.

—came John Ashhurst, jr., patient, unswerving in integrity, strict with himself, as with others, a fine example of the learned surgeon, leaving the stage just as it came to be filled with those who in their wonder at the achievements of modern surgery have had their gaze averted too much from the wonders achieved by the surgeons of earlier days.

Joseph Leidy, first connected with the University as Horner's Assistant and elected his successor in 1853, was for more than forty years Professor of Anatomy. Though one of the most distinguished naturalists in the world; he was a man of singular modesty and retiring disposition. His lectures were simple and unadorned, save for a faint touch of humor here and there, which was the more appreciated because of its contrast to his habit, and occasionally a passing reference to some minute investigation to which he alluded as though it had not deserved the applause of the scientific world. In the class-room he seemed to know nothing but his subject, and in the "green-room"—as the examination-room was then still called—which in those days tried the soul of the aspirant for a degree, he pushed the investigation of the students' knowledge with as calm an indifference as marked his scientific investigations. They never thought him unkind, though one of his amusements was never to let his victim go without having asked a question which he could not answer.

In the branch of Obstetrics the most conspicuous names were those of William P. Dewees and Hugh L. Hodge. Dewees was best known as the author of several works: one of them being on midwifery and another on diseases of children. The former was—after that of John Bard of New York—the first systematic work on this subject published in this country. Hodge was Professor of Obstetrics from 1835 to 1863 and the author of a work for many years indispensable to the student of midwifery, while he was the designer of a pessary which will probably always be employed in gynecology, and of the form of forceps well known by his name.

The successor of Hodge, in 1863, was R. A. F. Penrose, of whom—as happily he still lives, sole survivor of the Faculty of twenty-five years ago, from which he resigned in 1888—it is not an easy thing to speak. But those who enjoyed his teaching will surely never forget his instructive lectures or the rare treat they had once a year, when, with all the airs of secrecy—doors closed and tickets demanded—they looked down upon the table upon which lay, covered with a decent sheet, the form of Mrs. O'Flaherty, whose wooden frame and chamois-skin integument for so many successive years furnished an example of labor and the opportunity to demonstrate an ac-



D. HAYES AGNEW.

couchment; nor will they forget his humorous stories which fixed in their recipient minds truths which would have found a less cordial welcome if less entertainingly communicated.

Allied with the Department of Obstetrics is that of Gynecology, of which Dr. William Goodell was one of the first and most distinguished teachers in this country. To his success as an operator he added a most pleas-

ing method of lecturing: rare choice in the words used, simple, direct, homely, but singularly attractive. Withal he had the charm of candidly telling of his failures and making them quite as instructive to his students as were his successes.

Then there was Joseph Carson—"old Uncle Joe," he was called—with whose amiability his hearers sometimes took slight liberties, but for whom they all felt the deepest regard and respect; for twenty-six years he taught *Materia Medica* and *Therapeutics* with a wealth of knowledge and a depth of thinking that those who learned of him can never forget. Those were the days before manufacturing pharmacists had destroyed the poetry of *materia medica*; when the old man exhibited his specimens each one of which had for him a living interest like the gourd of "squirting-cucumber" which was always described as having been "sent to me from Joppa by my young friend, Mr. —, of the United States Navy." Those who listened to him will never forget the tears he could not restrain when he mentioned "my lamented predecessor in this chair, the late Dr. George B. Wood," or the break in his voice when he described the untimely death of the Princess Charlotte, or told of the heart-break of Condamine when his laboriously collected specimens of cinchona went to the bottom of the Amazon just as he was about to enter the ship that was to take him to France. Besides the memories that cluster round his years of teaching he left to the Alumni a History of the Medical Department of the University of Pennsylvania that will perpetuate both its fame and his.

Finally, there was Robert E. Rogers, made Professor of Chemistry after his brother James in 1852, and Francis Gurney Smith, made Professor of the Institutes of Medicine in 1863. Of these Rogers served longest. His lectures were full of interest, and those who attended them can picture him still with his pointer tucked under the stump of his right arm—injured by an explosion years before—while with his left hand he wrote upon the blackboard or manipulated the ingredients of an experiment. Amiable, impulsive, he made chemistry one of the most interesting branches of the curriculum. And Francis Gurney Smith, the polished teacher of physiology—before machinery and vivisection had ruined its graceful proportions or turned their prosaic searchlights into those dim corners where were supposed to lie hid such uncomprehended forces as "catalytic action"—strove not only to lead his hearers to a comprehension of the facts then known in regard to physiology, but also to direct their thoughts to the nobility of their calling, concluding his course of lectures with such pious wishes for their eternal happiness as in this day would hardly fit the general mood of man. And last, Wormley, the rigid, rugged, absolutely unswerving; the man of

science—one might say exclusively—the master of his department and seeming to have been made for it.

These are the great men of the past whose mantle now rests on shoulders no younger than were theirs when they began their career—on shoulders which, it is hoped, will grow to such proportions as become the followers of their great predecessors; so that he who describes their generation may feel for them such emotions as we feel toward those who have passed on before them.

The great men of the past are distinguished partly because they produced such results with such meager facilities for investigation and teaching. They had no instruments of precision, some of them had no knowledge of physical diagnosis, and others witnessed its birth. Equally meager were their physical accommodations. The first steps in medical teaching in the College of Philadelphia were taken in the homely old building called "Anatomical Hall," "Surgeons' Hall," on Fifth Street just south of the building still occupied by the Philadelphia Dispensary. Thence the College and the Medical School were removed to Ninth Street, to the building known as the "President's House," erected during the life of Washington and intended as a gift from the State of Pennsylvania to the President of the United States, whose occupancy was declined by President Adams for what he considered constitutional reasons and which was bought in 1800, and first occupied by the schools of the University (except for the chairs of Anatomy and Chemistry) in 1802. In 1829 this building was taken down, and on its site two others were erected which were the home of the University until it was removed to West Philadelphia, where step by step its accommodations increased until they are now probably unequaled in the world. Here is one of the finest dormitories in the country, a wonderful development of the idea which had its first expression in the small building erected in 1762 at the corner of Fourth and Mulberry (now Arch) Streets, with funds raised by a lottery. Here is the first and finest club-house—Houston Hall—ever erected for the use of students, and laboratories for every line of investigation connected with the science and art of medicine, and the Hospital of the University with its 285 beds. The staff of teachers in the Department of Medicine now numbers ninety-seven, and there is no new want discovered that does not receive the prompt attention of the Faculty, of the Trustees, and of the untiring Provost. An early champion for the highest standards of medical education, it is one of the best boasts of the Department of Medicine in the University of Pennsylvania that it stands to-day an acknowledged leader in this respect, and that it bears its full share in upholding the motto of the University, "*Littera sine moribus vana.*"

ORIGINAL ARTICLES.

A REPORT OF TWENTY-FOUR OPERATIONS PERFORMED DURING SPINAL ANALGESIA.

BY WILLIAM SEAMAN BAINBRIDGE, A.M., M.D.,

OF NEW YORK;

ATTENDING SURGEON TO RANDALL'S ISLAND HOSPITAL.

THE position that spinal puncture is to occupy in the surgical world continues to be an open question. Notwithstanding the favorable reports of many observers and the discouraging experiences of the few, the vast majority of the medical profession are wisely deferring judgment until further experimental evidence has accumulated and any possible remote effects have had time to develop.

The purpose of the present paper is to record the facts concerning some of the actual cases which have occurred in my practice, rather than the giving of an expression to any individual opinion.

In the *Medical Record* of December 15, 1900, I reported my first cases. Since then I have had over forty additional ones and of these the following are selected as of the most interest:

Case I.—J. R., male, aged eleven years; admitted to the hospital with a history of several epileptic attacks. During the past two weeks, no evidence of epilepsy, but distinct symptoms of chronic appendicitis. The last three days has had increased pain at times in the right iliac fossa, with a slight temperature. Cocaine analgesia, February 18, 1901. Place of puncture, to the right between the third and fourth lumbar vertebrae. Amount of cocaine, twenty minims of a two-per-cent. solution. Analgesia to the level of the diaphragm in five minutes after the injection. Vomited five minutes later. At this time it was learned that the patient had by some error secured solid food, although on a fluid diet, and, as far as the stomach was concerned, was totally unprepared for the operation. After this initial vomiting, which lasted but for a moment, there was no nausea or emesis throughout the operation. The usual "gridiron" appendicectomy was performed. The appendix was bound down by adhesions behind and to the pelvic side of the cecum. The peritoneum in the neighborhood of the vermiform, as well as the appendix itself, was acutely inflamed. (Subsequent pathological report on the examination of the appendix confirmed the diagnosis of chronic appendicitis with acute exacerbation.) The operation lasted fifty minutes, and was unaccompanied by pain or discomfort. At the end of the operation the analgesia was still complete to the level of the diaphragm. Before operation, temperature, 99.8° F.; pulse, 92; respiration, 22. Two hours after operation, temperature, 99° F.; pulse, 96; respiration, 24. Analgesia entirely disappeared in two hours and fifteen minutes after the completion of the injection. Slight nausea at one

time during the night. Temperature reached 101° F.; pulse, 104; respiration, 26.

February 19th: Twice to-day has seemed to be on the verge of an epileptic attack, clinching the fists and closing the eyes for a few moments. February 20th: Quiet day. No pain. Doing very well. February 26th: Stitches removed. Wound healed *per primam*. Convalescence uneventful. March 11th: Patient allowed to be up. Seems perfectly well. March 16th: Patient continues perfectly well. Discharged cured. No evidences of epilepsy during his stay in the hospital except those already noted.

Case II.—S. A., female, aged fourteen years; a highly neurotic child, large for her age, showing the general signs of malnutrition which so frequently accompany advanced tuberculous disease. Marked tuberculous arthritis of the left knee-joint and considerable contracture of the flexor tendons. Before admission to the hospital, treatment by retentive apparatus proved of no avail. Nocturnal pain materially interfered with sleep and the general health steadily failed. An arthrectomy seemed indicated. Cocaine analgesia, December 21, 1900. Place of puncture, to the left between the fourth and fifth lumbar vertebrae. No difficulty was experienced in introducing the instrument, but the cerebrospinal fluid did not flow and careful examination showed that the needle, although patulous when introduced, had become partially occluded by a small blood-clot. (a) A puncture was now made to the right between the same vertebrae and fluid readily flowed from the needle. Amount of cocaine, sixteen minims of a one-per-cent. solution. In seven minutes analgesia was complete to the knees but insufficient for the operation. No nausea or vomiting. (b) Second injection between the third and fourth lumbar vertebrae. Amount of cocaine, fifteen minims of a one-per-cent. solution. Analgesia in ten minutes complete up to the level of the clavicles, both in front and behind, including the axillae. No nausea or vomiting. Operation lasted forty-five minutes, and consisted of an excision of the knee-joint. There was extensive disease involving, not only the bones, but the soft tissues about the joint. After the capsule had been practically removed, ninety-five-per-cent. carbolic acid, immediately followed by strong alcohol, was applied. The patient throughout did not suffer the slightest pain, although at first she evinced some fear. Before operation, temperature, 98.2° F.; pulse, 102; respiration, 24. Two and one-half hours after, temperature, 98.8° F.; pulse, 112; respiration, 36. One and one-half hours after operation was completed analgesia had entirely disappeared. Patient had no nausea or vomiting until two and three-quarter hours after the operation when a repeated request for milk was granted and emesis occurred for the first and only time. Headache during afternoon and evening controlled by small doses of acetanilid, caffeine and sodium bicarbonate.

December 22d: Fair night. Very nervous at

times. Medicine required again for headache. Stomach retentive. Highest temperature, 102° F.; pulse, 128; respiration, 26. December 23d: Patient comfortable. December 24th: Better than before operation. December 25th: Temperature, pulse and respiration normal. Sleeping and eating well.

Case III.—Same patient; general conditions greatly improved. Cocaine analgesia, January 4, 1901. Place of puncture, to the right between the fifth lumbar and the first sacral vertebrae. Amount of cocaine, ten minims of a two-per-cent. solution. Analgesia to the level of the trochanter major in four and one-half minutes. Splint and stitches removed. Parts in excellent condition. Dressed and reapplied splint. Operation lasted thirty minutes, and analgesia entirely disappeared in one hour thereafter. Before operation, temperature, 98.2° F.; pulse, 102; respiration, 24. One and one-half hours after operation, temperature, 98.8° F.; pulse, 120; respiration, 24. There was no nausea or vomiting at any time, and three hours after the operation the patient consumed and retained bread and milk. But for a very slight headache of short duration, patient felt perfectly well.

January 5th: Patient has slept all night. No effects from the cocaine. Highest temperature 99° F.; pulse, 96; respiration, 24. February 14: Up and about, feeling very well, gaining steadily. March 1st: Has gained markedly in flesh and strength. Feels strong and well. Firm union. Splint continued. March 18th: Parents desire patient at home. Light splint applied. Discharged cured.

Case IV.—J. B., male, aged nineteen years. Strong and healthy with the exception of left lower extremity, which is partially paralyzed. Left dropfoot with congenital deformity of both feet. Cocaine analgesia, December 8, 1900. Place of puncture, between the fourth and fifth lumbar vertebrae. Amount of cocaine, twenty-five minims of a two-per-cent. solution. Analgesia to level of diaphragm in five minutes. Operation lasted fifty-eight minutes, and consisted of a tenotomy of the left tendo Achillis with an excision of the ankle-joint on the same side. Patient suffered no pain whatever. Vomiting and nausea were absent, and the only feeling of discomfort was felt a few moments after the injection, and described as "a dull heavy feeling in the stomach." Before operation, temperature, 98° F.; pulse, 74; respiration, 20. The highest respiration during the operation was 30, and the most rapid pulse 130. For some hours the patient complained of severe headache, which required frequent doses of acetanilid, caffeine and sodium bicarbonate before relief could be obtained.

December 9th: Had a fair night. December 13th: Plaster a little too tight. Splint removed; no after-effects from the cocaine.

Case V.—Same patient. Condition excellent but the necessity for further correcting the position of the foot renders some means for dulling

pain advisable. Cocaine analgesia, December 22, 1900. Place of puncture, between the fifth lumbar and the first sacral vertebrae. Amount of cocaine, twelve minims of a two-per-cent. solution. Analgesia began in two minutes and extended to the level of the knees in five minutes. Operation lasted about forty minutes, and consisted in the dressing of the ankle and forcibly bringing the parts into a more normal position. There was no pain or discomfort during the operation; no nausea or vomiting. Before operation, temperature, 99° F.; pulse, 94; respiration, 20. One hour after operation, temperature, 99° F.; pulse, 100; respiration, 22. At the close of the operation the analgesia was to the level of the diaphragm and totally disappeared in one hour and fifty minutes. During the afternoon some headache, slight nausea for a few moments, but no vomiting.

December 23d: Had a good night; patient comfortable, except for an occasional shooting pain in the ankle. December 24th: No after-effects of any kind apparent from the cocaine. January 15th: Patient in good condition; convalescence uninterrupted.

Case VI.—Same patient. Condition good. Further operation on the left ankle necessary for best possible result. Cocaine analgesia, January 21, 1901. Place of puncture, between the fourth and fifth lumbar vertebrae. Amount of cocaine, eight minims of a two-per-cent. solution. Analgesia to the level of the hips in ten minutes from the time of the injection. Operation lasted twenty minutes, and consisted of a tenotomy and osteotomy in the ankle and foot. Plaster applied. No nausea, vomiting or discomfort of any kind; patient talked to the physician and commented upon the various steps of the operation. At its completion the analgesia was up to the level of the diaphragm, but disappeared completely in fifty minutes. Four hours after the operation complained of some headache and of chilly sensations. Heat externally gave relief.

January 21st: Feeling very well. January 22d: No after-effects. February 8th: Up and about the ward with crutches. March 28: Convalescence has been uneventful.

Case VII.—J. H., male, aged fifteen and one-half years. Very poor general condition, with marked nephritis. Urine contains albumin, hyaline and epithelial casts; bacillus coli communis abundant. Caries of the ilium and tuberculous hip-joint with several sinuses. Cocaine analgesia, January 15, 1901. Place of puncture, between the fifth lumbar and first sacral vertebrae. (a) Amount of cocaine, ten minims of a two-per-cent. solution. Analgesia in ten minutes to the level of the trochanter major. Area of analgesia insufficient for the operation. (b) Second injection between the fourth and fifth lumbar vertebrae. Amount of cocaine, seven minims of a two-per-cent. solution. After fifteen minutes from the time of the second injection the analgesia had extended to the level of the free border of the ribs and was complete for the soft

tissues, but some pain was elicited when the bone was attacked. (c) Third injection between the third and fourth lumbar vertebrae. Amount of cocaine, seven minims of a two-per-cent. solution. A few minutes after the last injection the operation was begun. It lasted twenty-five minutes and consisted of the removal of dead bone from the hip-joint and the pelvis, and curettage of the old sinuses with the making of a large opening in the left buttock down to the sacrum, allowing free exit to considerable pus. No pain was felt and the patient was with difficulty kept from watching the operative field. Before operation, temperature, 100° F.; pulse, 94; respiration, 22. Two hours after operation, temperature, 98.4° F.; pulse, 92; respiration, 22. Analgesia disappeared in forty-seven minutes. Patient consumed milk two and one-half hours after the operation. No nausea or vomiting, but some headache.

January 16th: Slept well after taking two small doses of acetanilid, sodium bicarbonate and caffeine. January 18: Sitting up in bed; feeling very well; condition of urine about the same. March 20th: Patient up and about the ward and feeling very well. Considerable gain in flesh and strength since the operation.

Case VIII.—H. B., male, aged nine years; a strong healthy boy of nervous temperament. (Parents made a special request that the patient should be given something to prevent pain.) Cocaine analgesia, February 1, 1901. Place of puncture, the lower lumbar region. Amount of cocaine, ten minims of a two-per-cent. solution. Analgesia complete to the level of the diaphragm in three minutes. Operation lasted fifteen minutes, and consisted of a circumcision. Patient had nausea and vomiting a few moments after the injection. No pain or discomfort was experienced. Before operation, temperature, 98.4° F.; pulse, 77; respiration, 28. Two hours after operation, temperature, 99° F.; pulse, 80; respiration, 20. Analgesia completely disappeared in three hours. Severe headache for several hours after the operation. Some vomiting.

February 2d: Feeling very comfortable. February 8th: Patient perfectly well. Wound healed *per primam*. March 28th: Patient continues well.

Case IX.—M. B., female, aged eleven and one-half years; general condition fair. Tuberculous abscesses of foot with tarsal necrosis. Cocaine analgesia, February 7, 1901. Place of puncture to the right between the third and fourth lumbar vertebrae. Amount of cocaine, fifteen minims of a two-per-cent. solution. Analgesia to the level of the diaphragm in two minutes. Slight nausea and retching for a moment five minutes after the injection was completed. Operation lasted twenty minutes, consisting of opening the abscesses and removing carious bone and tuberculous tissue. Before the operation, temperature, 102.4° F.; pulse, 128; respiration, 26. One and one-half hours after the operation, temperature, 101° F.; pulse, 128; respiration,

26. At the close of the operation, twenty-five minutes after the injection, there was absolute absence of pain sense over the entire body. Tests proved also that the analgesia was present in the conjunctivae, the mouth, on the tongue, and the posterior pharyngeal wall. So far as I am aware, this is the first case recorded where analgesia has been present universally throughout the body. Twenty minutes after the operation was finished analgesia began to disappear. Pain sense returned to the head and upper extremities in thirty-five minutes and completely returned in one hour and five minutes. There was no marked shock or depression of the mental faculties either during the operation or subsequent to it.

February 8th: Had a slight headache, but no nausea or vomiting. Seven and one-half hours after operation, temperature, 103.4° F.; pulse, 144; respiration, 32. Took some milk to-day, but has slight repugnance for food.

February 9th: Slept well. Distinctly better than before the operation. February 10th: Condition greatly improved. Sinus healing. March 1st: Good condition. March 28th: Convalescence uninterrupted.

Case X.—W. E., male, aged seven and one-half years. General condition good. Phimosis and enuresis nocturna. Cocaine analgesia, February 19, 1901. Place of puncture, to the right between the third and fourth lumbar vertebrae. Amount of cocaine, ten minims of a two-per-cent. solution. Analgesia to the level of the diaphragm in six minutes. Patient somewhat hysterical immediately following the injection, but became perfectly quiet before the operation was commenced. Nausea and slight vomiting for two minutes in five and one-half minutes from the time the injection was completed. Operation lasted twenty minutes consisting of a circumcision. Patient had no pain or discomfort. Before operation, temperature, 99° F.; pulse, 100; respiration, 24. Two hours and fifteen minutes after operation, temperature, 99.5° F.; pulse, 98; respiration, 24. Analgesia disappeared in two hours and fifteen minutes. Headache for several hours. Vomited once, five hours after the operation.

February 20th: Complained of some headache during the night. Small dose of acetanilid, caffeine and sodium bicarbonate gave relief. February 21st: No after-effects. February 25th: Up and about, perfectly well.

Case XI.—A. M., male, aged sixteen years. Typical tuberculous child, having considerable kyphoscoliosis in the lower dorsal region, with marked prominence of the lower ribs on the right side. Chronic ulcerated cicatrix on the dorsal surface of the right foot. Cocaine analgesia, February 27, 1901. Point of puncture, to the right between the fifth lumbar and first sacral vertebrae. Needle was blocked by small blood-clot while passing through the soft tissues and was withdrawn. The needle freed from the clot was reinserted between the third and fourth lumbar vertebrae. Amount of cocaine, ten min-

ims of a two-per-cent. solution. Analgesia began in four minutes and extended to the level of the mid thigh in six. The operation lasted forty-five minutes, consisting of the excision of the cicatrix and the covering of the site of the old ulcer by flaps of skin taken from the outer side of the foot and leg. No nausea or vomiting; no pain or discomfort during the operation. Vomited once six hours after the operation and for some hours had headache. Before operation, temperature, 99.4° F.; pulse, 88; respiration, 24. After the operation, temperature, 99° F.; pulse, 84; respiration, 20. After the completion of the operation, tests showed that the analgesia had extended to the level of the nipples in front and behind, and there was motor paraplegia below the level of the hips. These completely disappeared in about two hours.

February 28th: Highest temperature during the night was 102° F.; pulse, 120; respiration, 28. Complains of some pain in the leg, but relieved by small doses of acetanilid, sodium bicarbonate and caffeine. March 2d: Patient seems entirely free from any after-effects. March 28th: Patient's general condition same as before operation. Foot slowly healing.

Case XII.—J. R., male, aged sixteen years; poorly nourished, of low vitality and probably tuberculous. Extreme left talipes equino-varus and an old ulcer with superficial necrosis of the plantar surface of the right os calcis. Cocaine analgesia, February 28, 1901. Place of puncture, to the right between the third and fourth lumbar vertebrae. Amount of cocaine, twenty minims of a two-per-cent. solution. Analgesia began in three minutes and was complete to umbilicus in eight. Some loss of motor power below hips. Operation lasted forty-four minutes, and consisted of the Phelps' operation for talipes on the left foot; old ulcer excised and part of right os calcis removed, with edges of the skin freed so as to make a complete skin covering to the heel. Ten minutes after the operation started, slight nausea and retching. Vomited bile-colored fluid twenty-five minutes later. During period of nausea a weak and rapid pulse was noted, with some cyanosis of the face. A hypodermic injection of $\frac{1}{100}$ of a grain of strychnine sulphate was given. There was no pain or discomfort during any part of the operation. Before operation, temperature, 98.2° F.; pulse, 90; respiration, 20. Two hours after operation, temperature, 98.2° F.; pulse, 108; respiration, 20. Analgesia completely disappeared in one and one-half hours after the operation, at which time motor power had fully returned to the normal. Two hours after the operation patient ate and retained a light lunch, consisting of bread and egg. Evening, temperature, 101.4° F.; pulse, 142; respiration, 26. Vomited once. Very slight headache.

March 1st: Feeling perfectly well but has some pain in the left foot. Afternoon temperature, 101.4° F. March 2d: Sleeping normally. Appetite good. March 28th: General condition as good as before operation. Feet doing well.

Case XIII.—E. D., male, sixteen years; feeble-minded; external and internal hemorrhoids. Cocaine analgesia, March 2, 1901. Amount of cocaine, twenty minims of a two-per-cent. solution. Place of puncture, to the right between the third and fourth lumbar vertebrae. Analgesia to the level of the diaphragm in two minutes from the completion of the injection. The operation lasted twenty-one minutes and consisted of the usual clamp-and-cautery operation. No pain, nausea, or vomiting. After the operation, the highest temperature was 99.2° F.; pulse, 94; respiration, 22. Analgesia completely disappeared in two hours and fifteen minutes.

March 3d: No after-effects from the cocaine. Slept all night. March 20th: Patient's recovery has been uninterrupted. March 25th: Perfectly well.

Case XIV.—H. C., male, nineteen years of age; fairly well developed, feeble-minded, deaf and dumb, hydrocephalic. A blind external fistula in ano. Troubled with frequent formations of pus. Cocaine analgesia, March 2, 1901. Place of puncture, to the right between the third and fourth lumbar vertebrae. Amount of cocaine, twenty minims of a two-per-cent. solution. (The needle had to be passed in twice, as the first time it became occluded by a small blood-clot and the cerebrospinal fluid failed to flow.) Analgesia complete to the umbilicus in four minutes. Operation lasted twenty minutes, and consisted of a division of the sphincter ani and excision of the diseased tissue. Slight nausea and headache, but no vomiting; no pain. Before operation, temperature, 98.6° F.; pulse, 99; respiration, 22. Seven hours after the operation, temperature, 98.6° F.; pulse, 72; respiration, 20. Analgesia entirely disappeared in two hours and forty minutes.

March 3d: Patient seems perfectly well. No apparent after-effects from the cocaine. March 25th: Patient perfectly well.

Case XV.—A. S., female, thirteen years of age; marked idiocy. Gangrene of the left foot. General tuberculosis. Circulation poor and condition bad. Cocaine analgesia, March 7, 1901. Place of puncture to the right between the third and fourth lumbar vertebrae. Amount of cocaine, sixteen minims of a two-per-cent. solution. Analgesia complete to the level of the diaphragm in four minutes. Operation lasted twenty-eight minutes and consisted of an amputation of the leg at the junction of the middle and lower third. No pain or apparent discomfort of any kind. Tests showed that at the end of the operation analgesia was complete over the entire body, except the face, mouth and eyes. Before operation, temperature, 98.6° F.; pulse, 122; respiration, 34. Three hours after operation, temperature, 99.4° F.; pulse, 112; respiration, 36. Analgesia completely disappeared in two hours and twenty minutes from the completion of the injection.

March 8th: Patient retains strychnine, whiskey and fluid diet without difficulty. Com-

fortable night. No nausea or vomiting during or since operation. March 14th: Patient doing well as could be expected. March 25th: Stump slowly healing.

Case XVI.—J. M., male, aged ten years, five months. General condition exceedingly bad. Highly neurotic. Advanced disease of left hip-joint, with a discharging sinus below Poupart's ligament, the opening of which is entirely too small. Has attacks now and again of precordial pain. Cocaine analgesia, March 12, 1901. Place of puncture to the right between the third and fourth lumbar. Amount of cocaine, twelve minims of a two-per-cent. solution. Analgesia to the level of the anterior superior spine in four minutes. The operation lasted four minutes, and consisted of an enlargement of the sinus and the making of a fresh opening for drainage over the trochanter major. At the completion of the operation, the analgesia had extended to the level of the diaphragm. No nausea, vomiting, pain, or discomfort. The patient left the operating-room evidently very little worse for the operation. Before operation, temperature, 99° F.; pulse, 94; respiration, 22. Two hours after the operation, temperature, 98° F.; pulse, 128; respiration, 48. Analgesia disappeared in one hour and a half from time of injection.

March 13th: Has been perfectly comfortable, having experienced no headache. Slept fairly well. Highest temperature, 104° F.; pulse, 150; respiration, 50. Retained strychnine and whiskey. March 14th: Complaints of pain in leg. Seems weak, but otherwise well. March 15th: Feeling better. March 23d: Distinctly better than before the operation. No effects from cocaine. Slowly improving. March 28: Much better.

Case XVII.—R. K., male, aged ten years; general condition fair. Tuberculous caries of the ilium with inguinal sinus. Patient was operated on November 2, 1900, subarachnoid injection of cocaine being employed.¹ No effects from previous spinal injection. Improvement has been steady, but the external opening of the sinus is now insufficient for drainage purposes and there is more dead bone to be removed.

Cocaine analgesia, March 14, 1901. Place of puncture to the left between the third and fourth lumbar vertebrae. Amount of cocaine, twelve minims of a two-per-cent. solution. Analgesia to the level of the umbilicus in four minutes. Slight nausea and retching nine minutes after the injection. The operation lasted eight minutes and consisted of enlargement of the outlet of the sinus and removal of dead bone and necrotic tissue. No pain or discomfort. The patient was asked whether, remembering what he had been through before, he feared the operation. He replied, "No, I was not hurt the last time." One hour before the operation, temperature, 100.5° F.; pulse, 90; respiration, 22. Five and a half hours after the operation, tempera-

ture, 100.4° F.; pulse, 98; respiration, 22. Analgesia disappeared entirely in one hour and a quarter after the injection.

March 15th: Considerable headache. Vomited several times last night and this morning. March 16th: Effects of the spinal injection entirely gone. March 28: Patient up and about. Doing well.

Case XVIII.—J. O., male, aged ten years; general condition good. Has had several attacks of tuberculosis of the skin which have been successfully treated by excision or cauterization. Has some new areas which have freshly broken out in the neighborhood of the old scars of the left leg and thigh.

Cocaine analgesia, March 21, 1901. Amount of cocaine, ten minims of a two-per-cent. solution. Analgesia to the level of the diaphragm in three minutes after the injection. Vomited three minutes later. Operation lasted nine minutes and consisted of the excision of the ulcerated tissue with the free use of the cautery along the edges and on the surface of the ulcers. No pain or discomfort during the operation, but immediately afterward a slight frontal headache was noted. Patient was thoroughly tested and it was found that the muscular sense, the ability to detect heat and cold and tactile sensibility were not lost. He was able to stand without difficulty and walk across the room. Before operation, temperature, 100° F.; pulse, 108; respiration, 22. Nine hours after the operation, temperature, 100° F.; pulse, 88; respiration, 22. Analgesia entirely disappeared in one hour and a half. Vomited three times during first six hours. Severe headache. Cried out with pain. Hypodermic injection of $\frac{1}{100}$ of a grain of nitroglycerin gave immediate relief and patient slept three hours.

March 22d: Slept well all night. March 24th: Normal condition except dizziness while walking. March 26th: No effects from cocaine. April 1st: Doing well.

Case XIX.—K. M., female, aged thirteen years; marked idiocy with epilepsy. Bad general condition. Phthisis pulmonalis. Circulation very poor in all extremities. Deep fetid gangrenous ulcer on the dorsum of the foot, which refuses to heal and is steadily increasing in size. Something must be done. Slowly getting worse. Cocaine analgesia, March 1, 1901. Place of puncture, between the third and fourth lumbar vertebrae. Amount of cocaine, fifteen minims of a two-per-cent. solution. Analgesia complete to the level of the umbilicus in three minutes. Operation lasted fifteen minutes, and consisted of the Chopart's amputation. No apparent pain. No nausea or vomiting. Before operation, temperature, 98.5° F.; pulse, 92; respiration, 22. Three hours after operation, temperature, 98° F.; pulse, 72; respiration, 26. During the evening had an epileptic seizure which lasted some minutes.

March 2d: Taking small doses of codeia, strychnine and whiskey. Quiet. March 3d: Do-

¹ For report of previous operation, see *Medical Record*, Vol. LVIII., No. 24, p. 937.

ing as well as could be expected. March 16th: Stump almost healed. March 18th: Refuses to take nourishment. General condition getting worse. March 20th: Phthisis increasing. March 21st: Pulmonary hemorrhages. March 22d: Died.

*Case XX.*¹—A. F., male, aged eleven years; general condition fair. Spinal curvature. Tuberculous sinus of knee. Cocaine analgesia, February 15, 1901. Point of puncture in the lower lumbar region. Because of the kyphosis the needle had to be introduced in a very oblique direction. Amount of cocaine, fifteen minims of a two-per-cent. solution. Analgesia to the level of the navel in eight minutes. Operation consisted of enlargement of the sinus and the removal of some dead bone. Four hours before operation, temperature, 99° F.; pulse, 106; respiration, 24. Two hours after operation, temperature, 99.2° F.; pulse, 98; respiration, 22. No pain, nausea, or vomiting. In one hour and fifty-five minutes analgesia completely disappeared.

February 16th: Slept well. Very comfortable. February 17th: Patient up and about feeling perfectly well. March 28th: Sinus almost healed. Recovery uneventful.

The fact that in several cases there had been analgesia above the level of the diaphragm led to attempts to operate upon the upper extremities. The following cases show what success was attained.

Case XXI.—E. J., male, aged nine years and nine months, fair general condition, highly neurotic, advanced tubercular arthritis of the left elbow. October 6, 1899, resection of elbow under ether, took anesthetic badly from the first. As small amount of ether given as possible. The operation was completed with difficulty and before the patient was removed to the ward active stimulation and inversion of the body with artificial respiration were necessary. The respiratory center seemed almost paralyzed. For some hours the patient's condition was considered bad. November 18th: Wound healed well, except a small sinus over the lower end of the humerus.

Cocaine analgesia, November 19, 1900.² (a) Place of puncture to the right between the second and third lumbar vertebrae. Amount of cocaine, five minims of a one-per-cent. solution. At the end of sixteen minutes from the time of injection no analgesia had become evident. (b) Second injection at the site of the first. Amount of cocaine, seven minims of a one-per-cent. solution. No analgesia fifteen and a half minutes from the second injection. (c) Third injection to the left between the second and third lumbar vertebrae. Amount of cocaine, eight minims of a one-per-cent. solution. Vomited in two and a half minutes. Presented the same symptoms as in other cases, except there was no true analgesia. Operation was postponed. Before opera-

tion, temperature, 98.6° F.; pulse, 96; respiration, 24. Three hours after the last injection, temperature, 99.4° F.; pulse, 116; respiration, 32. Very restless during the afternoon. Complained of headache. Some vomiting.

(The remainder of the solution which was used in this case was carefully tested. It was found to be practically inert. This was the only case where heat was used in the method of sterilization of the cocaine. The second operation was done under the same supply of the drug, except prepared by the ether method.)

Case XXII.—Same patient; general condition good. Small sinus over the end of the left humerus continues to discharge. Cocaine analgesia, February 13, 1901. Place of puncture to the right between the third and fourth lumbar vertebrae. Amount of cocaine, eight minims of a two-per-cent. solution. In three minutes analgesia complete to a point midway between the ensiform cartilage and the umbilicus. At the end of seven minutes nausea and retching for a moment. In nine minutes analgesia complete over the entire body, including the mouth and tongue. Operation lasted seven minutes and consisted of an enlargement of the sinus and the removal of dead bone and tuberculous tissue. Patient was quiet and experienced no pain. One hour before operation, temperature, 99° F.; pulse, 100; respiration, 22. One hour after operation, temperature, 99° F.; pulse, 98; respiration, 26. Highest temperature since the operation, 102° F.; pulse, 108; respiration, 26. At the end of twenty minutes from the time of the injection the analgesia began to disappear about the shoulders and head. Analgesia completely disappeared in one hour and ten minutes. No nausea or vomiting following the operation.

February 14th: Slept well. No nausea, vomiting or headache. Temperature, 99.2° F.; pulse, 94; respiration, 24. February 15th: As well in every respect as before the operation. March 28th: Patient's condition continues normal.

Case XXIII.—A. W., male, aged eleven years. Very poor general condition. Has tertiary syphilis and multiple tuberculous sinuses of the left lower arm and forearm with extensive caries. For months an effort has been made to save the extremity. In spite of tonics there was some diminution in flesh and strength. His condition growing worse. Amputation seems indicated. Cocaine analgesia, February 15, 1901. (a) Place of puncture to the right between the third and fourth lumbar vertebrae. Amount of cocaine, twenty minims of a two-per-cent. solution. Analgesia at the end of fifteen minutes not being above the level of the hips, a second injection was determined upon. (b) Place of puncture to the left between the third and fourth lumbar vertebrae. Amount of cocaine, ten minims of a two-per-cent. solution. Six minutes after the second injection analgesia was absolute below the umbilicus. As the analgesia did not extend into the upper extremity, amputation was de-

¹For previous operation under eucain analgesia, see Medical Record, Vol. LVIII, No. 24, page 939.

²Reported in a discussion at a meeting of the Medical Association of the Greater City of New York, Dec. 10, 1900.

ferred, it being thought best not to increase further the amount of cocaine which the patient had already received. To have pushed the dose further for experimental purposes would have been interesting, but hardly just under the circumstances. Patient was returned to the ward apparently not affected deleteriously by the injections. Temperature before injection, 99° F.; pulse, 90; respiration, 22. Five hours after operation, temperature, 100° F.; pulse, 122; respiration, 24. There was no nausea or vomiting, and not even pain when the needle was pushed deeply into the analgesic areas. Analgesia totally disappeared in about two hours.

February 16th: Has had no after-effects from the cocaine; slept all night. February 18th: Is in as good a condition as before the injection. February 27th: Chloroform administered, and left arm amputated in its upper third. Enlarged glands in the left axilla removed. March 28th: Patient's general condition has greatly improved since the removal of the arm. Stump practically healed.

Case XXIV.—S. B., female, aged seventeen years (appears at least nineteen). Strong healthy girl suffering from idiocy and sub-acute cellulitis of the left thumb with necrosis. Cocaine analgesia, March 14, 1901. Place of puncture to the left between the second and third lumbar vertebrae. Amount of cocaine, thirty-two minims of a two-per-cent. solution. Analgesia to the level of the hip-joints in five minutes. After fourteen minutes, analgesia complete to the level of the clavicles, in front and behind, including the upper extremities. The operation lasted fourteen minutes, and consisted of an amputation of the left thumb at the lower third of the metacarpal bone. No pain during the incision of the soft parts, but the cutting of the bone evidently slightly painful, although insufficient to cause the patient to withdraw the hand from the surgeon. (During the severing of the soft tissues the patient sang the National air.) At the close of the operation there was some retching, but no emesis. The patient was sent to the ward in good condition, with the analgesia still as complete as at the beginning of the operation. Pain sense returned in one hour. Before the operation, temperature, 98.6° F.; pulse, 94; respiration, 22. Six hours after operation, temperature, 104° F.; pulse, 122; respiration, 24.

March 15th: Patient has experienced absolutely no after-effects of the cocaine, with the exception of a slight headache. March 19th: Patient up and about. Seems perfectly well. Wound healing nicely. March 28: Convalescence uneventful. Stump healed.

General Remarks.

The cases thus described have not been specially selected. Some have been decidedly unfavorable for any operative procedure, and in a few the operation was at best a forlorn hope. By

thus testing this method in all sorts of conditions, its proper position will be more quickly established.

No difficulty has been experienced in introducing the needle either in adults or in children. A few times the needle has been clogged by a small blood-clot while the instrument passed through the soft tissues, before entering the spinal canal; examples, Cases II., XI., XIV. A few experimenters, at such times, use the stylet, pushing into the intra-dural cavity whatever is in the needle. This is certainly to be condemned. The withdrawal of the instrument and a fresh introduction is the better plan.

Summary of Fifty Cases.

The following conclusions are made from fifty cases, the above being included in that number:

1. Cocaine is far more satisfactory than eucain. The latter is less potent, more evanescent, the areas of analgesia are frequently "patchy," having the pain sense retained all around them and not being so complete below definite levels. The cocaine produces no more unpleasant after-effects than eucain and is decidedly more reliable.

2. Analgesia to the level of the diaphragm can be depended upon in all cases where a moderate dose of a potent solution of cocaine has been introduced by lumbar puncture. In some the analgesia is sufficient for operation on the upper extremities; examples, Cases IX., XV., XXII., and XXIV.

3. Complete analgesia, including the eyes, mouth and throat has occurred; example, Case IX. It does not entail more severe after-effects than when the lower extremities only are involved.

4. The preparation of the patient as for a general anesthetic diminishes all the unpleasant effects of cocaine and eucain and often prevents them altogether.

5. By moderate doses of bromides before the injection the initial vomiting is frequently avoided and the liability of headache lessened.

6. In neurotic patients there are often hysterical symptoms directly following the completion of the injection, but, as a rule, in a few moments a calm follows and the patient lies perfectly still.

7. Initial nausea and vomiting often occur soon after the puncture, but last only for a moment or two, and usually do not recur during the operation. As consciousness, as well as the muscular power, is preserved, the danger of the introduction of the vomitus into the lungs is practically nil.

8. Analgesia lasts from thirty minutes to four hours.

9. Depression after the puncture is inconsiderable. The use of ethyl chloride (Bengue) largely prevents pain when the needle is introduced.

10. The preparation of the patient, the use of nitroglycerin by hypodermatic injection, or the employment of coal-tar products with caffeine,

control the headache, which is in many instances an after-effect of spinal puncture.

11. In a few cases there may be motor paraplegia or vertigo. Both are temporary. Example, Case XI.

12. Spinal puncture has not affected normal or diseased kidneys.

13. Usually the tactile power, muscular sense, and the ability to detect heat and cold are retained. The cautery at a dull red heat causes no pain, while hot water produces marked discomfort.

14. Usually the patient sleeps the first night.

15. There is often a temperature of a few degrees within eight or ten hours of the operation. Whether this is the direct result of the puncture or the effect of psychic disturbances is not determined. The circulation and respiration are not seriously embarrassed.

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SOME SOURCES OF ERROR IN LABORATORY CLINICAL DIAGNOSIS.

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ONE of the most noticeable developments in medical practice during the last quarter century has been the widespread application of the methods of the natural sciences to the solution of every-day diagnostic problems. The chemical analysis of the secretions and excretions, the microscopical examination of the blood, the search for the bacterial causes of disease by staining and culture have become familiar to us all.

Such advances in knowledge must of necessity lead to greater accuracy in diagnosis, but they cannot, as many think, make an easier road to it. On the contrary each new method requires added skill and added knowledge and can never supplant, but only supplement the old. The foundation must be anatomical in the diagnosis, as in the study of disease, and without physical exploration no investigation of function can be of service. I think the time has come to emphasize the fact that clinical diagnoses cannot be made in the laboratory. A diagnosis must be individual and comprehensive and attained not by analysis alone, but by analysis and synthesis. Only the clinician is in a position to balance all the facts in a given case and to determine their relation to one another. Therefore the first requisite for a diagnostician is not technical skill, but a judicial mind, capable of weighing the value of evidence.

"*Sine diagnosis nulla therapia*" is a trite quotation; each of us who undertakes the treatment of disease must be a diagnostician—or a charlatan—none of the latter, I feel confident, will read these words. Therefore as practitioners we must utilize, so far as possible, the re-

sults which the laboratory can furnish us. Some of the methods are of such a nature that any one can use them in his office. Of these he must know the limitations and possible errors inherent in the methods themselves. Others require an amount of time, apparatus and technical skill which places them beyond the reach of all but special laboratory workers. Here the practising physician should know the worth of their findings as positive or negative evidence.

It is evident from this that the sources of possible error in the application of laboratory methods to diagnosis are twofold; those due to the methods themselves or faulty technic in their use, and those due to inaccurate reasoning from accurate results. The writer has been fortunate in the opportunity of making, wholly or in part, some fifteen to eighteen hundred laboratory examinations a year for several years, in the consulting practice of his father, where his results were controlled by clinical observation which was available to him. He has thus obtained so large a personal experience of the possible sources of error that he has thought a consideration of the more common ones might prove helpful.

Examination of Urine.—The greatest value of the examination of the urine undoubtedly lies in the direct evidence it may afford of disease in the kidney or urinary passages and of diabetes. To most practitioners this means the application of the familiar tests for the presence of albumin and sugar. They are certainly the foundation of clinical urine analysis and will be considered seriatim.

Tests for Albumin.—Those in most common use are the cold nitric-acid ring test (Heller's), boiling with the addition of acetic or a drop of nitric acid (heat and acid), and the acetic acid and potassium ferrocyanide test. Other reagents less frequently employed are trichloroacetic acid, picric acid, bichloride of mercury in Spiegler's test and potassio-mercuric iodide in Tanret's reagent.

Errors in Technic.—The most conspicuous of these is a failure to filter the urine. It is absolutely impossible to make a delicate test in an unfiltered urine or with turbid solutions. In the ring tests there must be a sharp line of demarcation between the solution and the reagent. The presence of bile or of urates in large amount renders Heller's test almost useless. Where there is any possibility of the occurrence of albumose, the tube should be warmed, an albumose ring being dissolved while an albumin ring is unaffected by heat. The same holds good for the rings formed by certain drugs, the balsams and rhubarb especially. These, in addition to their disappearance on heating, are usually of a reddish or brown color. The turbidity produced by urates is never at the line of junction of the acid and urine, but forms from above downward. Heller's reaction, in the case of small quantities of albumin, may take as much as fifteen minutes to develop, and the tubes should

not be discarded within that time. In the heat and acid test, the upper layer of urine in a long test tube should be boiled and the acid added and a comparison made with the clear urine below. The faintest turbidity can be detected by examining the tube against a black background—a small book answers excellently—between the tube and the window. With light falling from behind the examiner the test is much less delicate. Tests made by dropping the solution into the urine should always be judged by the side of a tube of filtered urine. Finally, the acetic-acid and ferrocyanide test needs an especial check, that is, comparison, not with clear urine, but with urine to which acetic acid alone has been added. The addition of acetic acid and subsequent filtration has never been of service to me, as the acetic-acid precipitate passes through the best filter paper I have been able to obtain. Both of these reactions can be clearly brought out by the contact method, the acetic acid and solution of potassium ferrocyanide being mixed in proportion of one part of the first to two of the latter. The ring should always be compared with that developed by acetic acid alone. Made with these precautions, a positive result, that is a greater turbidity of an actual precipitate in the urine tested, or a ring in the case of those tests, indicates the presence of some proteid body.

Errors Inherent in the Methods Themselves.—Unfortunately our knowledge of the proteids appearing in the urine is very incomplete. Nucleo-albumin is of the most frequent occurrence, trace of it being demonstrable in nearly every urine as a faint cloud on the addition of acetic acid, with dilution if the urine be concentrated. Next come serum albumin and globulin, the presence of which in spite of the old classification of a certain group of cases as "physiological albuminuria," must probably always be regarded as pathological in the strict sense. Fibrin and fibrinogen, albumoses, egg albumin and casein have been found in special conditions. Perhaps the globulins of the urine are not all the normal serum globulin. The practical problem, therefore, in the diagnosis of disease of the urinary apparatus is the detection of serum albumin and globulin, which can be classed together, and possibly of abnormally large amounts of nucleo-albumin.

What is the value of the common tests for the detection of these albumins? Nucleo-albumin alone is precipitated by an excess of acetic acid in the cold and this test gives positive evidence of its presence. Only very marked turbidity is of any practical importance and this mainly from the error it may introduce into the other tests. In my experience the most reliable of these are Heller's, the acetic acid and potas. ferrocyanide and the heat and acid tests. The ferrocyanide test, made as described, in comparison with the cold acetic-acid test, probably gives the strongest positive evidence of the presence of albumin, but it is the least delicate and the most cumbersome. The heat and acetic-acid test in a proper light is

in my opinion the most delicate and the easiest of application, trichloroacetic acid and Spiegler's and Tanret's reagents equaling it, but offering no advantage. The absence of any haziness with this test I consider absolute evidence of the absence of albumin. A positive reaction, however, which I find in at least nine out of every ten urines examined, if slight is probably due to nucleo-albumin and is of no significance. Marked turbidity or a flocculent precipitate affords definite positive information. As a general test, Heller's is undoubtedly the most useful. I have seen instances where I felt sure that a faint ring was due to nucleo-albumin, as I obtained a stronger one with acetic acid used in a similar way and had no deepening of the acetic acid turbidity on the addition of potas. ferrocyanide; but these cases are of great rarity. Sahli says that nucleo-albumin may respond to Heller's test. Almost always, however, a true ring, even the most delicate, indicates pathological albumin and its absence, under the precautions given, is valid negative evidence so far as appreciable quantities are concerned.

Significance of the Findings.—May any conclusions be drawn from the presence of albumin in the urine? Emphatically none, except that an albuminous urine is not normal, and therefore a further investigation by other methods must be instituted to determine its source. This may be from inflammatory conditions or hemorrhage anywhere in the urinary tract, from congestion, from admixture with menstrual flow, etc. The microscope gives the most evidence on this point, but the whole examination furnishes subsidiary information. On the other hand, the absence of albumin at one, or even repeated examinations does not at all preclude the existence of kidney disease. The contracting kidney frequently fails for considerable periods to give an albuminous urine. I have seen several cases, within only a week or so, of definite uremic attacks, where the urine was normal. Waxy kidney has been reported without albumin in the urine. Acute nephritis is, of course, excluded by its absence. The greatest significance of a negative test is, however, in cardiac cases, in which it gives evidence of the absence of congestion of the kidney and makes a more hopeful prognosis.

Tests for Sugar.—I think few physicians who have not examined many hundred urines appreciate the numerous errors into which one may be led by that universally employed reagent, Fehling's solution. It is the most delicate test for sugar and certainly the most useful for just one purpose—to exclude its presence. I wish to lay particular stress upon that point, for it has been forced upon me unwillingly. Every one knows that various drugs, rhubarb, salicylates, camphor, chloral hydrate, some of the coal tar series and alkaloids, etc., and even the abundant urates of a concentrated urine, will give some sort of reduction, but until recently I had felt that I could distinguish in most cases between these spurious reactions and the real sugar re-

duction. Unfortunately, a number of careful comparative tests have made me certain that it is impossible, and I now use the test solely for the negative evidence it may afford. No reduction with Fehling's solution invariably means no sugar, a reduction merely indicates the necessity for applying further tests. Therefore I will not take time to speak of wrong methods in using Fehling's solution, for from this standpoint they are unimportant.

The tests which do give positive indications of the presence of sugar are the polariscope, fermentation and the phenyl-hydrazin reaction. The first of these is little used clinically, being too expensive and too cumbersome for most physicians. The second is simple, reliable if one is careful to use fresh yeast and stand the tube twenty-four hours in a warm place and has the advantage, when the Einhorn tubes are used, of affording a quantitative determination, sufficiently accurate for clinical purposes. Where this is desired care must be taken that the urine does not contain over 1 per cent. of sugar, the necessary accurate dilution being made to bring it down to this. The only objection to the method is its slowness and its lack of delicacy.

The phenyl-hydrazin test, when applied after the method of A. Kowarski (*Berl. klin. Woch.*, Nov. 26, 1900), is a rapid means of determining the presence of sugar. The employment of phenyl-hydrazin-hydrochloride and sodium acetate as ordinarily given is most unsatisfactory, but the use of pure phenyl-hydrazin, 5 drops, glacial acetic acid, 10 drops, and sat. sol. sodium chloride, 1 cc. to 3 cc. of urine, boiling vigorously two minutes and letting cool slowly in the air, has given me most excellent results. For bringing to my knowledge this manner of performing the test I have to thank Profs. E. K. Dunham and John A. Mandel.

Significance of Sugar.—I only wish to state briefly what is now becoming well recognized, namely, that the presence of sugar in the urine does not constitute diabetes. Only the persistence of sugar after the reduction of the carbohydrates in the diet to a small amount can warrant that diagnosis. For the discussion of alimentary glycosuria and the other more transient forms I would refer to the books upon that subject, especially to Von Noorden's last edition of his work, "Die Zuckerkrankheit und ihre Behandlung."

Quantitative Urine Analysis.—Many physicians appreciate that quantitative estimations demand a sample of mixed twenty-four-hour urine for their performance, but do not realize that even the most ordinary test is of little value if made with the urine passed at one time alone. Unless a fairly representative specimen of the daily excretion is obtained no conclusions at all can be drawn from the absence of sugar or albumin, nor can much be inferred from their presence. A representative specimen should mean the mixed urines passed on at least three

different occasions during at least twelve hours. An excellent method, where a twenty-four-hour specimen cannot be obtained, is to take equal parts of the water passed in the late afternoon, before retiring and on rising in the morning. Even with such a specimen, however, careful quantitative methods should not be used, as the results may be misleading. The simplest quantitative method, and it is strictly such, is the estimation of the specific gravity. The only common source of error in the use of the urinometer is a neglect to make the correction necessary for changes in temperature. The instruments are graduated at a certain temperature, usually at 15° C. (59° F.), while the average room temperature is 20° C. (68° F.). The correction being 1 for every 3° C. (5.4° F.), a urine giving a reading of 1.012 at 68° F. with one of these instruments really has a specific gravity of 1.015. Beside this it should be borne in mind that quantity and specific gravity bear an inverse relation to one another and are meaningless when considered alone. The two together give the total solids excreted.

Obtaining an accurate twenty-four-hour specimen from patients not confined to bed is a matter of considerable difficulty. In spite of all explanations they often will not use the requisite care. This at the outset introduces a possible error into all quantitative methods employed, and it is to my mind an explanation of some of the anomalous results obtained.

One of the commonest errors in connection with the specific gravity is to conclude that a urine does not contain sugar if it is below some arbitrary point, 1.030 or 1.025 or even 1.020. Some such rule is a tradition in many hospitals and its fallaciousness should be understood. I have seen sugar urines a number of times with a gravity of 1.015. Some have contained not traces, but as much as 1 per cent. of glucose. Another mistake of opposite character is the failure to recognize the significance of urine of constant low gravity and increased quantity, if albumin be not present. Such urine points strongly to the existence of the contracting kidney, one of the most frequent types of chronic Bright's disease, and should always lead to a thorough examination of the patient, especially with reference to the presence of a hypertrophied heart and high arterial tension.

The quantitative determination of urea, or rather total nitrogen, by the hypobromite method, as in the Doremus, Squibb and other uremometers, is simple and sufficiently accurate for clinical purposes. Only the total amount excreted in twenty-four hours is of any value. The most frequent cause of inaccuracy comes from decomposition of a twenty-four-hour specimen in hot weather, the loss from this being considerable. The urea excretion is so closely dependent upon the diet and other factors that I consider it a mistake to draw many conclusions even from a much reduced amount at a single examination. For practical purposes the total

solids, as indicated by the quantity specific gravity ratio, afford as much and less often misleading information.

Occasional Tests in Common Use.—Of these the Ehrlich diazo-reaction and the tests for bile and indican are most frequently employed. The limits within which the first mentioned can be utilized for the early diagnosis of typhoid fever are becoming well recognized. Emphasis should be laid upon its being considered as corroborative evidence of typhoid only when found in the first week or ten days of a febrile affection.

The tests for bile are apt to be conspicuous by their absence. Small amounts of bile in the urine can be easily detected by Gmelin's test and should always be suspected when the foam is at all yellow. The staining of cells and casts yellow, as seen under the microscope, is an excellent indication of its presence. The finding of bile is important for diagnosis and it should not be overlooked.

The practical value of the examination for indican is so slight and the diagnostic problems connected with it are so complicated that I shall not speak of it.

Microscopical Examination.—No error could be greater than to consider any urine examination complete without the use of the microscope. A thorough microscopical examination requires a proper collection of the sediment, preferably by centrifugalizing, or if that is impossible by allowing the urine to stand at least six hours in a conical glass. Many things of importance will be overlooked if this is not made a matter of routine, notably casts, when not numerous, and a few red blood-cells, which in many cases aid greatly in the discovery of renal calculus as the cause of obscure one-sided pain in the back or abdomen. This condition I am confident is frequently overlooked. The foreign substances which find their way into specimens are many and often lead to confusion; but it is not within the scope of this article to treat of the possible errors in observation. Only a personal experience can teach one their nature. Certain points, on the other hand, which have made a considerable impression upon me, do not seem adequately brought out in the current text-books. One of these is the occurrence of calcium oxalate in a form which closely resembles a red blood-corpuscle in size and shape. It appears perfectly circular and can only be distinguished by its darker more refractile outline, its greater variation in size and usually by the presence of a dark dot at the center. The association of typical octahedra is helpful, but blood-cells may be present as well, and close observation is necessary to be sure of a discrimination. Certain yeast (*torulæ*) may also be confused with red cells, unless one notes the budding forms. Another point is a simple method for getting rid of the excess of amorphous urate deposit, which in winter often obscures everything in the microscopic preparation. I pipette off the sediment from the urine into a test tube, add an equal volume of water, warm

gently until the urate cloud disappears and then centrifugalize. Simply warming will not prevent the rapid reappearance of the turbidity, but the dilution has always answered to keep all in solution. This method is, of course, chiefly of use when all the sediment can be quickly recovered with the centrifuge, but could be applied in a conical glass by using larger quantities.

The presence of casts without albumin has been denied by Simon, who says that he has never met with the condition since using the trichloroacetic acid test. The occurrence is undoubtedly of considerable rarity, but I have met with several cases in which I used particular pains in applying the trichloroacetic acid test, and could not elicit even a faint haziness. Such findings illustrate the necessity for making one's observations all independent of each other.

The examination of urine for tubercle bacilli should not be undertaken by any one who has not had considerable experience in the identification of the tubercle bacillus in sputum, etc. Much is said of the possibility of confusion with the smegma bacillus and the inadequacy of any method except animal inoculation for their differentiation. I do not feel qualified to speak on this point, for I have not yet met with tubercle-like bacilli except in cases of clinical genito-urinary tuberculosis.

Urinary Diagnosis.—Given accurate and complete observations, are errors in diagnosis often made? Some, I fear; especially when the clinical signs and symptoms are not given their due importance. Glycosuria, for instance, is too often called diabetes. The presence of albumin and casts is frequently considered direct evidence of nephritis, when it may be but the sequence of congestion dependent upon a weak right heart, primary, or secondary to mitral or lung lesions. A few casts may cause an albuminuria to be thought of renal origin, when the presence of blood-cells or pus-cells, if given just weight, might place the more important lesion in the pelvis of the kidney or bladder. Such mistakes are always possible to one who seeks a diagnosis from less than a complete consideration of the whole case, and this cannot be obtained in the laboratory.

Examination of Sputum.—Many physicians fail to realize that except in the diagnosis of tuberculous disease, the microscopical investigation of the sputum can give any information of practical value. I should be glad to call their attention to the frequent help that examination of the unstained expectoration may afford. The association with asthma of Charcot-Leyden crystals, more rarely of Kurschmann's spirals, is a strong point in its diagnosis. The more recently described occurrence of large numbers of eosinophilic cells in asthma sputum is still more striking and the double-staining, with eosin and methylene blue necessary to demonstrate them, is simple. The condition most frequently confused with phthisis is the chronic congestion of the lungs due to mitral disease, especially mitral

stenosis. These cases have continued cough, dyspnea, often hemoptysis and loss of weight. The physical exploration of the lungs will not afford any reliable evidence for differential diagnosis; that of the heart, if mitral stenosis be discovered, makes tuberculosis improbable. The sputum, however, gives the most definite information and that not alone by the absence of tubercle bacilli, but by the strong positive evidence of the large cells filled with brownish pigment, which are usually present in considerable number.

Staining for pneumococcus and streptococcus, Pfeiffer's influenza bacillus, etc., has not demonstrated any great practical result, the clinical diagnosis being more satisfactorily made from the other features of the diseases. Rare organisms, such as streptothrix and actinomyces, ova, etc., occasionally give the clue to unusual conditions and should be considered where no ordinary cause can be determined for marked pathological changes in the lungs. In the same category should be placed malignant growths, which, however, seldom give aught but negative evidence in the sputum.

Staining the Tubercle Bacillus.—The common methods, Ziehl-Nielsen, Gabbett's, etc., need only to be used accurately to give satisfactory results, but careless staining is a simple waste of time. The most frequent faults are insufficient staining, which leads to a failure to find the bacillus, and incomplete decolorization, which invites confusion with other organisms retaining the red color. The latter is the more serious mistake. If it be borne in mind that the bacillus tuberculosis has a distinct form and that it is as erroneous to call any bacillus of red color the tubercle bacillus as to call any white animal a polar bear, the chance of error would be materially diminished. The use of dirty cover-glasses and slides, needles or dishes may account for some reports of tubercle bacilli in cases which have proven the falsity of the microscopical diagnosis. I do not believe that any slide, cover or receptacle for the sputum should ever be cleaned and used again for this purpose, as the seriousness of the question at issue, to my mind, outweighs any considerations of petty economy. In receiving reports from another examiner, especially from a large laboratory, the physician should always bear in mind the possibility even of clerical error or substitution of one specimen for another, where the microscopical belies the clinical diagnosis.

The more common negative report, where tuberculosis is unquestioned, arises oftenest from the examination of sputum which has not come from the chest, either because the patient has failed to bring a proper specimen, or the examiner has not selected a proper portion for spreading. Patients should be carefully instructed to bring sputum raised from deep in the chest, the early morning secretion is usually best, and no pains should be spared to pick out one of the little grayish particles, or lacking this some, muco-purulent streak. This can only be

done from a thin layer of expectoration on a black ground. I know nothing more satisfactory for this work than the turned wood sputum boxes, with a water-tight black varnish inside, designed by Dr. Stuart Hart and sold by Lincoln & Luchesi. They, with their contents, are burned after examination. With these precautions, a negative result will be less frequent; but there are undoubtedly a fair number of cases of pulmonary tuberculosis in which tubercle bacilli cannot be demonstrated, even after several examinations. Therefore it should always be borne in mind that only positive findings, free from sources of error, are of absolute diagnostic significance.

Examination of Blood.—The value of the study of the blood as an aid to diagnosis has been fully demonstrated within the last few years. Its practice, however, requires a trained microscopist, and the majority of practitioners are forced to have recourse to the laboratory specialist to make such examinations for them. Unfortunately, all who are now willing to undertake blood examinations have not reached the superhuman condition of infallibility, though their reports are apt to be considered final. The practitioner here, as elsewhere, should accept no diagnosis without a full consideration of the clinical evidence and should be able to understand the results, if not to practise the methods of hematological work.

Quantitative Methods.—The ones in common use are those for the estimation of hemoglobin and specific gravity and the counting of the red and white corpuscles.

Errors in the Use of the Methods.—The error incident to any test which requires the matching of shades of color is naturally considerable and varies with different persons. The determination of the percentage of hemoglobin by the ordinary methods, Von Fleisch, Gowers, etc., therefore, can only be approximate, but in most cases is sufficiently accurate for clinical purposes. I have never thought the specific-gravity method an efficient substitute, and the improved Von Fleisch-Miescher hemoglobinometer requires much more time than its results are worth. In cases showing a very low hemoglobin content the error is much increased. Some bloods also are of a color impossible to compare with the standard; this is especially notable in leucemia, the results here being almost worthless. The counting methods are much more accurate and in careful and practised hands their results can be accepted without hesitation for the drop of blood examined. Much is said in books of the necessity for scrupulous cleanliness in order to obtain absolute contact between cover and slide in the Thoma-Zeiss hematocytometer. Cleanliness is of course essential, but the greatest obstacle to the attainment of the desired Newton's rings I have found to be, not a thin film of grease, but large obvious particles of dust. For this reason I have for several years made a camel's hair brush an essential part of the outfit for

blood-counting, and by dusting slide and cover with it just before using, perfect contact is obtained. I consider it one of my most useful instruments, for it stands me in equally good stead in making blood-films for staining or examination in the fresh state.

Morphological Examination.—This, whether in the fresh state, or by the various general and special staining methods is an essential part of any blood-examination. Without it no count has any value. In this way only can leucemia be differentiated from a leucocytosis, or the malarial organism be discovered, or the diagnosis of pernicious anemia be confirmed. The faults in the preparation of stained specimens can only be learned by personal experience, and the same is true of most of the errors in observation. A few of them may, however, be advantageously pointed out.

Errors of Observation.—The most common of these center around the malarial organism. What I have said of the tubercle bacillus applies with equal force here. The malarial organism has a definite form at each period of its development and no one should attempt its identification without familiarity with its characteristics. The common vacuoles within red cells, blood-plates, masses of extraneous dirt, are too often called plasmodia, and that in cases where good clinical observation should make a diagnosis of malaria untenable. On the other hand, the small hyaline forms are frequently overlooked and crescents may be so rare that several examinations are needed to discover them. Only a very competent observer should make a diagnosis from the presence of unpigmented or extracorporeal forms, except the crescents and ovoids. The new polychrome methylene-blue stain just perfected by Dr. L. B. Goldhorn places the staining of the chromatin of the parasite within the ability of all and should safeguard from many former errors. One cause of failure to find the organisms may be the selection of a wrong time for the search. The most favorable time is usually about eight hours before the chill, the parasites accumulating more in the internal organs at the time of segmentation. In doubtful cases examinations should be made at different periods. In the estivo-autumnal form even the best microscopist may be unable to arrive at a diagnosis for several days, as the parasites may be extremely scarce in the peripheral circulation.

Errors of observation regarding the classification of nucleated red cells and of leucocytes are possible, but fortunately untrained men less frequently attempt the diagnosis of the anemias. Even among hematologists there is not a unanimity of opinion regarding the exact limits of certain of the cell forms. The differentiation of leucemia from leucocytosis should, however, be made by even a novice in blood-work, if he will only bear in mind that the increase in leucocytosis involves the polymorphonuclear, in the leucemias, the mononuclear leucocytes. The Widal reaction and blood-cultures should not be at-

tempted outside of a well-equipped bacteriological laboratory.

Errors in Estimating the Value of the Evidence Obtainable From Examination of the Blood.—These are frequent and at times serious. In the first rank come the mistakes in the diagnosis of febrile affections, especially when remittent or intermittent in type and unaccompanied by well-marked local symptoms. In this class of cases the blood-examination may be of great assistance. Finding the malarial organism makes, of course, a positive diagnosis. A negative result, however, has only a relative value, depending on the care of the observer and the corroborative findings. A definite leucocytosis combined with an absence of plasmodia is the strongest evidence against the existence of malarial infection and should discredit the diagnosis of malaria in almost every case. The leucocytes should always be counted when the parasite is not found. On the other hand, if there be no leucocyte increase, the question of typhoid fever or tuberculosis arises, especially the former. The Widal reaction should then be tried, but unfortunately it is absent in many cases of typhoid fever during the early period when the diagnosis is doubtful, and a negative test has absolutely no value as evidence. In such cases cultures from the stools and the diazo-reaction in the urine may prove useful, but the clinical course, properly studied, will afford the most reliable indications.

A marked leucocytosis is a sign which should never be neglected. In continued fevers it always points to the existence of sepsis, and unless there are well-marked complications of an inflammatory nature it should lead to a careful revision of a diagnosis of typhoid fever. In these cases of obscure septic conditions errors are common and every means of investigation should be used. In the decision as to operation for supposed appendicitis, I am convinced that the count of the white cells, especially as to an increasing leucocytosis, should be given more weight than at present. Unfortunately, leucocytosis cannot be accorded implicit confidence as a sign of inflammatory trouble. On one hand, it is from time to time absent in severe cases, as, for instance, of general peritonitis or pneumonia or diphtheria; in quite a proportion of patients with ulcerative endocarditis I have failed to find it; on the other hand, very exceptionally, it is found in early typhoid fever. But in the main he who avails himself of the information the white cells afford will avoid far more errors than he will fall into.

The value of the Widal reaction has been so much discussed in special papers that I will not speak of it, except to call attention to the possible, if slight, danger of confusion of specimens in large laboratories. I have known one case in which a laboratory diagnosis of typhoid led to the overlooking of a large internal abscess for three weeks, the explanation probably being a mistake of that kind. I feel strongly that no phy-

sician should allow a laboratory to make a diagnosis of typhoid fever for him, and any such diagnosis by a laboratory should discredit it.

In the field of the true blood-diseases the thing lies somewhat differently. Here the main, sometimes the entire diagnostic evidence is found in the blood, and the opinion of the specialist in such diseases should have the greatest weight. The evidence may be either positive or negative, the latter having especial importance in distinguishing pseudoleucemia from chronic lymphatic leucemia.

Examination of Stomach Contents.—The qualitative and quantitative methods used in the examination of gastric contents are for the most part sufficiently accurate for clinical purposes; that is, the errors in drawing conclusions from the results far outweigh most of the errors of observation. The fundamental points in the quantitative methods are, of course, the test meal and the time of its removal. In order to obtain comparative results these factors should be the same in every case, within certain narrow limits. The finding of lactic acid, for instance, has no meaning if milk has been taken; this most often occurs from the patient using a roll made with milk. Another obvious prerequisite for accurate results is that the contents of the stomach be obtained without the addition of any water.

Töpfer's method as given out by him included the use of alizarin as an indicator. I have not found that any reliance could be placed upon it and have abandoned it, using Congo red to estimate the total free acid and acid salts. The end reaction of dimethyl-amido-azo-benzol was found by Dr. J. S. Thacher, in a set of experiments at the Presbyterian Hospital Pathological Laboratory, to be an orange red and not the standard yellow in the presence of free lactic acid. This should be borne in mind and lactic acid tested for before proceeding to the titration. If present, the soda solution should only be added until the color changes from scarlet to orange red.

The usual tests for lactic acid, Uffelmann's, Kelling's, etc., are subject to so many errors when applied to the filtered gastric contents direct that a positive reaction should not be considered due to lactic acid unless it be corroborated by a test made in a solution of an ether extract of the filtrate.

The test with iodo-potassic-iodide for starch and erythrodextrin I consider capable of affording useful subsidiary evidence and I think it should not be omitted. An occasional test, which should always be applied when there is a suspicion of altered blood, in vomit especially, is Teichmann's for obtaining hemin crystals.

Errors in Reasoning.—The most that we can obtain by our analysis of gastric contents is a functional diagnosis. In most patients with disorders of the stomach the functional disturbance is the disease; in some, however, it is the symptom of organic changes in the organ. The presence of blood, if we can prove that it has come from the stomach, of necessity indicates some

organic lesion, be it ulcer or cancer, or a congestion secondary to cirrhosis of the liver or cardiac disease. Mucus in any quantity, especially if it contain leucocytes and epithelial cells when examined microscopically, points to a catarrhal process. Apart from these the laboratory affords no direct light on the causes underlying the disturbance of function, and in many cases of dyspepsia the gastric secretion will be found normal. Hydrochloric hyperacidity is strong corroborative evidence of ulcer of the stomach only in conjunction with stronger clinical evidence, and the same is even more true of the absence of free HCl and presence of lactic acid, once hailed as a certain diagnostic sign of cancer.

Even the discrimination of the exact disorder of secretion present requires care in reasoning. An increase in total acidity above the normal may be due to increase in HCl or organic acids, and a complete examination alone is of value. Where there is no hyperacidity a condition of hypersecretion may be present. A large amount of unconverted starch gives some indication of this, showing an early inhibition of salivary digestion. Sometimes an entire absence of secretion and digestion may be found, where the explanation is a nervous inhibition of secretion due to the effect of the awaited examination. The stomach is so closely related to all the other organs of the body and is so influenced by the nervous system that the most searching examination of the physical and psychical condition of the patient can alone guard against serious errors.

In conclusion I would crave indulgence for the many inadequacies in the discussion of the subject, which are inseparable from the standpoint of personal experience, necessarily incomplete, from which I have approached it, and trust that the consideration of certain of the sources of error in the great field of the clinical laboratory may help some to a more just appreciation of its scope in diagnosis.

36 West Fortieth Street.

MEDICAL PROGRESS.

Chemistry of Blood During Fever.—A careful chemical examination of the blood of a patient who exhibited febrile periods interrupted by afebrile intervals has been made by K. STEJSKAL (*Zeitschrift. f. klin. Med.*, Vol. 42, 3 and 4). During the fever there was found a reduction of proteid and dried residue, fat, cholestrine, iron and chlorine compound while water, calcium, potassium and total ash were increased and the lecithin and sodium remained normal. With serum alone there was a diminution of all ether extractives and chlorides and an increase of potassium. The red cells were deficient in albumin, cholestrin and lecithin and richer in water and salts. Their weight has increased through imbibition of the plasma. All these changes, the author thinks are due to the temperature alone.

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SATURDAY, MAY 4, 1901.

ASSOCIATION OF AMERICAN PHYSICIANS.

THE sixteenth annual meeting of this distinguished body was a memorable and noteworthy occasion. The attendance was excellent, the program was most interesting and the discussions spirited and awakening.

Comparisons are invidious, but certain of the papers presented were worthy of special praise as offering not so much technical dissertations on recondite and unusual subjects, but practical considerations of fundamental and ever-present problems.

Dr. C. A. Herter of New York read a highly interesting communication on the relations of acid intoxication to the development of diabetic coma. He showed by specially devised chemical methods that the amount of the organic acids might be accurately measured and that as the amount of these organic acids increased and were not neutralized by the bases, formed in metabolism, the danger of coma grew more imminent. These methods offered a practical method of pre-venting the occurrence of this dangerous complication and offered a hint for the beginning of active treatment.

The papers of Drs. Barker, Novy, and Flexner

on their recent investigations on plague in San Francisco were noteworthy. The work done by this Commission merits the highest praise and its members well deserve the thanks of the country at large for their labors. The stamping out of the plague in this country can now be assured because of the suggestions made by the Commission to the health authorities of California.

Drs. Reed and Carroll had the occasion to further supplement their work in Cuba, and from the results more recently announced it may be asserted with confidence that an important etiological factor in the spread of the scourge of yellow fever has found a definite solution. It may be mentioned in passing that the soldiers of the United States who submitted to the experiments are as real heroes of the Spanish-American War as those that indulged in the horrors of battle.

The proceedings of this meeting of the Association will go down in history as embodying some of the most important contributions the science of medicine has ever received.

THE PROTOZOON OF CANCER.

NEEDLESS to say Dr. Gaylord's article on the "Protozoon of Cancer" in the May number of the *American Journal of the Medical Sciences* will attract widespread attention. We may still hesitate to accept the opinion that cancer is really on the increase in the alarming degree mortality statistics in this country and in England seem to show, but there is not the slightest doubt that the mystery of the cause of cancer is the most important pathological problem before modern medical science. So many futile attempts at its solution have been made, so much time has been unsuccessfully devoted to its investigation by the great authorities in pathology, that there is now a natural skepticism aroused by any claims of definite results. With this feeling most of Dr. Gaylord's readers will approach his article.

This much is evident even on a cursory reading. His work has been well done. We may be proud to have the results of Dr. Gaylord's researches go forth to the medical world as the type of work accomplished by American investigators under favorable circumstances. The *American Journal of the Medical Sciences* is the most widely read by scientific medical circles in Europe, so that we can be sure that the article will not only attract attention, but

evoke the criticism without which no medical work goes on to its perfect evolution. New light has undoubtedly been thrown on the cancer problem and the State of New York, by whose subvention the laboratory researches have been made possible, may well be congratulated on the fact that one of the first appropriations made for the investigation of a special subject in medicine has been used so faithfully and, as it would seem, with so much promise of ultimate benefit for the race. The money has been well invested and the attention of philanthropists can scarcely fail to be attracted to the importance of material aid for the furtherance of similar researches.

With regard to Dr. Gaylord's article it may be said, first, that his review of the work of others in the investigation of cancer etiology has been not only complete, but eminently fair, and impartial and, second, the conclusions based on his own work, as far as its ultimate results may be anticipated at this stage of the investigation, are modest and unassuming. Certain of his observations go far to overcome prejudice as to the insolubility of the cancer mystery. The fact that the supposed parasites can be seen without staining, for instance, tends at once to reconcile the reader to their probable significance. So many mistaken claims in cancer etiology have been founded on artefact appearances due to elaborate staining methods that this latest observation is at least refreshingly novel. The fact that the appearances thought to be micro-organismal resemble fresh fat droplets, yet prove after the application of the ether and osmic-acid tests to be composed of other material, has not much significance in itself. Some unusual form of degeneration might be expected to occur in cancer. When this observation is, however, taken in connection with the fact that the number of such bodies present increases very materially during twenty-four to forty-eight hours after the removal of the malignant tumor, there seems good reason to think that we are in the presence of a far-reaching discovery.

So-called fatty degeneration of carcinoma is not infrequent and Dr. Gaylord now interprets the appearances that are presumed to demonstrate the condition as really due in some part to the presence of the various forms of an organism of cancer. These have hitherto been mistaken for fat droplets and for infected epithelial cells which were supposed to

be in an advanced stage of fatty degeneration. The centers of carcinomata that have undergone degeneration to such an extent that the contents are fluid, thus producing the so-called "cancer milk" of the older writers, are in Dr. Gaylord's opinion practically pure cultures of the cancer micro-organisms, and he adds, "The fluid from malignant ovarian cysts likewise contains a large number of the organisms and the peculiarly characteristic mush found in the cavities of certain adenocarcinomata of the ovaries is likewise largely composed of the various forms of the parasite."

Dr. Gaylord has not succeeded in cultivating the micro-organism he has been observing. As he has employed sixty-four kinds of culture media, it would seem that the question of the microbe being a saprophyte is definitely settled. These experiments would also seem absolutely to preclude the idea of the microbe under observation being a yeast. The protozoan nature of the organism might thus be assumed by exclusion. In confirmation of the theory of the protozoan character of the cancer parasite, Dr. Gaylord has made some interesting comparative observations with certain appearances recently described in vaccine lesions. Comparative tests made with staining methods show that the half-grown forms of the vaccine organism, as described by Gorini last year, are very closely related in appearance to the bodies seen by Plimmer and Russel, English observers whose work has been confirmed by Dr. Gaylord's researches. The protozoan forms in carcinoma all have their prototypes in the various stages of development of the vaccine organism.

Our two greatest pathological problems, the etiology of smallpox and cancer, seem to be approaching solution together. Dr. Gaylord has been able to produce some apparently malignant neoplasms in animals. The demonstration of his micro-organism in the circulation of animals suffering from cancer cachexia is interesting and eminently suggestive. The cause of cancer cannot be said to be definitely discovered, but an important step forward in our knowledge of cancer etiology has been made. That this should come as the result of the coördination of the observations of investigators in many countries adds to the probability of ultimate success. Medical discoveries have never been made out of the whole cloth of absolute invention. They have ever been,

just as in this case, foreshadowed by many observers before being ultimately formulated in their true expression.

THE PHYSICIAN, A DISREGARDED FACTOR IN MEDICAL PROBLEMS.

THE recent death of the Bell Bill limiting the practise of so-called "Christian Science" but confirms the well-known and often-stated fact that legislation alone cannot prevent abuses in the medical world. In discussing the time-worn topic of the regulation of the dispensary abuse the general tendency has been to blame the pauper element among those who are not dependent upon charity for availing themselves of the gratuitous medical advice proffered by the dispensaries, and to advocate careful investigation of their financial status.

While acknowledging the advisability of this method it must not be overlooked that the members of the profession can do much to aid the movement by their personal attitude, in convincing those who are in a position to recompense a physician that the acceptance of charity treatment lowers such an individual in the public estimation. The investigation of applicants is hindered by the wish of the dispensaries to present a creditable record of the number of "worthy poor treated, and incidentally by the desire to obtain a more generous share of the city appropriation for the treatment of such cases.

Fully as important a factor, however, is the attitude of the medical men themselves in this matter, and by their coöperation alone can the abuse of dispensary charity be regulated. Patients are allowed to receive treatment "for teaching purposes" although they may refuse to appear before the classes, or through carelessness as to their financial condition, or in some cases in the hope that they may eventually be turned toward the office of the attendant.

The present overcrowding of the medical profession leads to the necessity for some form of advertising. As the number of physicians in the city increases, so does that of the dispensaries and hospitals, nominally for charitable purposes, but often really for the sake of giving places as attending physicians. This in turn leads to the admission of unworthy applicants as patients in order to fill the dispensary. In favor of the multitude of these institutions, however, may be raised the just argument that comparatively few of the horde of men annually graduated can se-

cure the necessary education given only by a resident service in a good hospital, and hence must obtain what practical experience is possible by dispensary service, while the confiding public gradually affords opportunities for learning the clinical features and treatment which theoretical instruction cannot convey. Another, and an almost unanswerable argument in favor of the admission, without thorough investigation, of patients who apply at dispensaries is the fact that many of those who can afford the luxuries of life yet still demean themselves to accept charity treatment at a dispensary, are of such a moral caliber that they would cheat a private physician out of his time and money by intentionally neglecting his bills.

The remedy for the dispensary abuse includes not only an examination of the financial condition of applicants, but also restriction of the number of graduates from the medical schools. As competition diminished the necessity for cutting rates, advertising through dispensary positions, etc., would also decrease. Such restriction must necessarily be brought about by more stringent requirements by the medical schools themselves. As long as they continue to graduate any but those best qualified by nature and education for the duties of the medical profession, just so long will the ranks of that profession be overcrowded and this overcrowding with incompetent men merely aids the existence of quacks, "healers," and others who pretend to possess supernatural powers in the treatment of disease.

The mistakes of regular physicians are what drive many a patient to the quack, and anything that will improve their diagnosis and treatment will go far toward removing this support of the powers of darkness. This is best obtained by elimination. The tendency of medical institutions of learning to fill their halls is most natural. A large attendance increases the reputation of the college and last, but not least, furnishes the support without which the maintenance of these institutions would be impossible. Again, it would be held that were the standard of medical education in this city raised it would not affect outside institutions and the city would still be flooded with the products of diploma-mills. Such an argument is not conclusive, as a beginning must be made in any movement and this can nowhere be done better than in the largest and most prolific of medical centers in this country. When the public realizes that the standard of certain institutions is high they will eventually

be more likely to demand men from these sources.

And how is this result to be accomplished? Let those charitably disposed give for the endowment of existing medical institutions, rather than for the erection of new buildings to bear their names, and a serious obstacle in the way of elevation of the standard of the profession will be removed. And let the members of that profession urge the importance of this point upon their would-be benefactors. The true philanthropist will consent, the egotist will demand the construction of a permanent memorial to himself.

ECHOES AND NEWS.

NEW YORK.

New York Academy of Medicine.—The Section on Otolaryngology meets Wednesday, May 8th. Dr. E. W. Pyle will read a paper on "A Correlation of One Hundred Successive Mastoid Operations." Section on Pediatrics on Thursday, May 9th. Dr. W. S. Bainbridge will read a paper on "Spinal Analgesia in Twelve Operations on Children under Three Years of Age." Dr. J. F. Terriberry will show a case of double birth palsy; Dr. J. H. Larkin will report a case of hypertrophic pyloric stenosis; Dr. W. S. Bainbridge a case of double strangulated hernia at four months; operation and recovery; a case of cancrum oris; operation, recovery. Drs. M. Nicoll, Jr., and A. J. Lartigau will present a "Preliminary Report on an Investigation of Adenoids with References to Tuberculosis"; and Drs. W. L. Carr and Samuel Pierson will report a case of general subcutaneous emphysema.

At the meeting held May 2d, the following candidates were recommended for election to Resident Fellowship: Drs. S. A. Brown, W. H. Caswell, J. J. Higgins, John Horn, P. D. Kerran, C. A. McWilliams, and F. F. Ward.

Gibbs Memorial Prize Fund.—The Trustees of the Academy announce that Mrs. Sarah Barker Gibbs and Miss George Barker Gibbs have given \$10,000 to be invested for the establishment of the Edward N. Gibbs Memorial Prize Fund. The income is to be awarded triennially to the physician of regular standing in the medical profession of the United States who shall present the best original essay on the etiology, pathology and treatment of diseases of the kidney.

Yale Commencement Speaker.—Prof. Edmund B. Wilson, of Columbia University, will be the commencement-day speaker at the Yale Medical School.

New York State Medical Society.—At the ninety-fifth annual session of the Medical Society of the State of New York held at Albany, New York, January 29, 30 and 31, 1901, it was moved and unanimously adopted that in order

to increase the facilities for becoming permanent members of the Society, each County Society should be allowed to send five times the number of delegates it had formerly sent to the State Society. These delegates are elected for a term of three years and are eligible for permanent membership if they register twice during that time. This will make the number of delegates from the County Society to the State Society 750 in all, or one delegate for every eight or nine members of the County Societies without increase of expense to the County Societies.

It was further agreed in response to a widely-expressed desire, that the Society hold a semi-annual meeting in the City of New York in the early autumn to be devoted entirely to scientific work and social intercourse. The officers of the Society announce that they have engaged the New York Academy of Medicine for this purpose where a meeting of two days' duration will be held October 15, 16, 1901.

Members wishing to read papers are requested to communicate with Dr. Nathan Jacobson, 430 S. Salina street, Syracuse, N. Y., and information of any other nature can be obtained from Dr. Frederick C. Curtis, Secretary, 17 Washington avenue, Albany, N. Y., or from Dr. Frank Van Fleet, Associate Secretary, 63 East 79th street, N. Y. City.

It is further announced that the Society will tender a reception to its members, delegates, and guests, on the evening of October 15th at Delmonico's. Tickets of admission to this reception will be furnished without cost to all who register at the semi-annual meeting as well as to the Society's guests.

Pathological Staff Resigns.—The entire corps of associates and assistants to Dr. Ira Van Gieson, Director of the Pathological Institute of New York, handed him their resignations on April 30th. This action was intended to show their sympathy for and loyalty to Dr. Van Gieson, whose removal was ordered by the Commission in Lunacy to take effect on May 1, 1901. Dr. Van Gieson has begun suit for possession of the pathological specimens and other property of the Institute.

Heredity.—Professor J. George Adami, of McGill University, Montreal, will deliver an address under the auspices of the Brooklyn Medical Club, on Friday, May 17th, at 8:30 P.M., in the Medical Library Building, 1313 Bedford Avenue, Brooklyn. His subject will be "The Medical Aspect of Heredity."

PHILADELPHIA.

Appointment of Dr. Kelly.—Dr. Aloysius O. J. Kelly, Instructor in Clinical Medicine in the University of Pennsylvania, was recently elected Professor of the Theory and Practice of Medicine in the University of Vermont. He leaves Philadelphia shortly for Burlington to begin his professional duties and will return to Philadelphia in the early fall.

Pay Hospital for Contagious Diseases.—

The promoters of this enterprise state that the hospital will be in working order in the early autumn. One of the greatest difficulties to overcome has been the prejudices of citizens against the proximity of the building. An accessible site six miles from the City Hall, outside of the city limits, has been chosen. The entire cost of the hospital will be \$100,000.

Homeopaths Demand a State Insane Asylum.—

A deficiency bill carrying an appropriation of \$1,000,000 now before the State Legislature bids fair to become available for charitable purposes. If this end is attained two institutions will probably benefit thereby. Members of the homeopathic medical fraternity are making a strong plea for an insane asylum to be under the control of the members of their school as there is not an asylum in Pennsylvania where a homeopathic doctor is admitted to practise. They ask for \$200,000 with which to erect a building. The projectors of the State Hospital for Consumptives also desire an appropriation of \$100,000.

Symposium on Diphtheria.—The meeting of the Philadelphia County Medical Society on April 24th was devoted to the above topic. Dr. J. D. Steele, in a paper on "The Present Aspect of the Antitoxin Treatment," gave statistics of the mortality-rate in Chicago, New York, Boston, and Philadelphia. These showed the latter city to have a higher rate than either of the others. Dr. Steele thought this due to a lack of energy in the prompt use of antitoxin. Dr. Packard believes it is caused by the failure of physicians to report many mild cases in order to prevent the quarantining of houses.

Clinical Aspects of Diphtheria.—Dr. F. A. Packard in speaking on the above subject said that bacteriological cases of diphtheria, i.e., cases in which the bacilli are tolerated in the throat with no clinical symptoms are often a source of more danger to the community than are cases of clinical diphtheria. The absence of local discomfort is more suspicious of the Klebs-Löffler infection than of a pyogenic infection. Bleeding from the nose should excite suspicion of diphtheria. The pallor of the skin and mucous membranes of diphtheria is not seen in any other form of angina.

The Treatment of Diphtheria.—Dr. M. H. Fussell said that antitoxin given early is a specific. The only positive diagnosis of diphtheria is made from bacteriological examination of the throat but while waiting for this antitoxin should be given. He rarely uses more than 1,000 units at a dose, but repeats it unless improvement is rapid. Applications to the throat should be made or not made according to the individual. He has seen deaths result from persistent application to nervous, resisting children. Simple alkaline solutions are sufficient for applications, hydrogen peroxide not giving favorable results in his experience.

CHICAGO.

Bazaar at St. Luke's Hospital.—A bazaar was given at this institution a few days ago by the graduating class of the St. Luke's Hospital Training School for Nurses, netting \$1,000, to be applied to the charity work of the hospital.

Nicholas Senn Hall.—A permit was issued April 17th for the erection of a seven-story addition to Rush Medical College, to be ready for occupancy November 15th. The building will be devoted to clinical instruction, and it is said it will cost \$115,000.

Symptoms and Diagnosis of Gastric Ulcer.—

At the meeting of the Chicago Medical Society, held April 4th, there was a symposium on ulcer of the stomach. Dr. N. S. Davis, Jr., read a paper with this title. Attention was called to the frequency with which the malady occurs. Many pathologists have found evidences of former gastric ulcer or existing ulcer in from three to ten per cent. of those who were examined at autopsy. The diminished acidity of the urine and the occurrence of an alkaline wave after meals, and the diminished amount of chlorides in the urine were described as evidences of hyperacidity of the stomach and as occurring in strange contrast to the conditions existing in cancer and chronic gastritis with which round ulcer is so often confused. Digestive leucocytosis exists in cases of gastric ulcer, but as a rule is slight or wanting, in cases of cancer and chronic inflammation. Persistent and even anemic leucocytosis occurs in most cases, of course, but does not occur in round ulcer. The ratio of hemoglobin to red corpuscles often resembles that of pernicious anemia in cancer, but that of chlorosis in round ulcer. In both maladies hemorrhages often reduce both equally at least for the time being.

Blind Medical Men.—A blind student was graduated with honors a few days ago at a medical college in Chicago. Aided by his highly developed senses of hearing and feeling, he hopes to become a successful specialist in the treatment of ills that have to be diagnosed partly by sound and touch. A sightless physician in Boston who died while yet a young man had already become noted as a specialist. There are several practising physicians in this country who cannot see.

GENERAL.

Bacterial Laboratory at Yale.—By a rearrangement of four rooms in Sheffield Hall a new bacterial laboratory has been constructed for the use of the senior class in sanitary engineering. It has accommodations for about twenty students.

Wheeling Medical Library Association.—About three years ago a number of the members of the medical profession in the city of Wheeling, West Virginia, realizing that the existence of a medical reference library for the Mountain State had become a necessity to the

intelligent study of the science of medicine, organized the Wheeling Medical Library Association. This association is now in a most thriving condition, having on its shelves over seven hundred volumes, and on file all the leading medical and scientific magazines printed in the English language. At their recent annual meeting the following officers were elected: President, Dr. Frank Le Moyné Hupp; Secretary and Treasurer, Dr. William Hay McLain; Librarian, Dr. J. Schwinn.

American Surgical Association.—The regular annual meeting of this Association for 1901 will be held in the city of Baltimore, at the Library Building of the Medical and Chirurgical Faculty of Maryland on Tuesday, Wednesday and Thursday, May 7-9, 1901. The program gives unusual promise. The President, Dr. Roswell Park, will deliver an address on "Some Phases of the Cancer Problem," and the following papers are announced: "Early Signs of Carcinoma of the Uterus" by T. S. Cullen; "Cancer of Breast Treated at the Johns Hopkins Hospital since 1889" by W. S. Halsted; "Late Results in Inoperable Sarcoma Treated with Mixed Toxins" by W. B. Coley; "Mental Depression and Malignant Disease" by J. D. Bryant; "The Examination of the Blood in Relation to Surgery" will be discussed by several. Drs. J. C. Bloodgood, J. C. Da Costa, Jr., J. B. Blake, J. C. Hubbard, R. C. Cabot, J. L. Kalteyer, J. B. Deaver and W. W. Keen will be among those who will contribute papers. Prof. Mayo Robson of England will read papers on "Pancreatitis" and "Treatment of Chronic Ulcer of the Stomach"; "Arterio-venous Aneurism" by R. Matas; "Operative Intervention for Tumors of the Liver" by W. G. Macdonald; "Subtrochanteric Osteotomy" by E. H. Bradford; "Phlebitis Following Abdominal Operations" by A. Vander Veer; "Operation for Radical Cure of Umbilical Hernia" by W. J. Mays; "Fractures and Dislocations of the Spine" by S. H. Weeks; "Radical Cure of Inguinal and Femoral Hernia" by W. B. Coley; "Resection of Chest Wall for Large Sarcoma" by W. W. Keen; "Pulmonary Insufflation" by R. Matas; "Silver Wire and Electricity in the Treatment of Aneurisms" by Leonard Freeman; "Movable Kidney" by M. L. Harris; "Abdominal Contusion and Nephrolithotomy" by S. J. Mixter; "Malignant Forms of Rodent Ulcer" by J. Collins Warren; "Congenital Sacrococcygeal Tumor" by Chas. A. Powers; "Vicious Circle after Gastro-Enterostomy" by T. A. McGraw; "Splenectomy for Myelogenous Leucemia" by M. H. Richardson; "Dislocation of Tibia and Arthrotomy" by J. B. Roberts and "Pneumonotomy" by W. Joseph Hearn.

Johns Hopkins University.—The Medical School has just opened several important special courses of instruction for graduates in medicine, which will continue during May and June. These new courses are intended to

meet the requirements of practitioners of medicine, and are almost wholly of a practical character. Next October a limited number of physicians will be admitted to a special class for the study of the important tropical diseases, especial attention being given to malaria, dysentery, and typhoid fever. Preference will be given to officers of the medical departments of the army and navy.

Western Ophthalmological Association.—The following officers were elected at the sixth annual meeting of the Western Ophthalmologic and Oto-Laryngologic Association held in Cincinnati April 11th and 12th: Dr. C. R. Holmes, Cincinnati, O., President; Dr. W. L. Dayton, Lincoln, Neb., 1st Vice-President; Dr. J. O. Stillson, Indianapolis, Ind., 2d Vice-President; Dr. H. W. Loeb, St. Louis, Mo., 3d Vice-President; Dr. O. J. Stein, 100 State street, Chicago, Treasurer; Dr. William L. Ballenger, 100 State street, Chicago, Secretary.

At the meeting in Cincinnati the scientific program was of very high grade. Forty new members were elected. The next meeting will be held in Chicago, April 10, 11, and 12, 1902.

Dentists for the Army.—The Army bill of this year made provision for the first time for the care of soldiers' teeth by authorizing the appointment of dental surgeons by the Secretary of War on the recommendation of the Surgeon-General. These dental surgeons are to be in the proportion of one to every 1,000 men of the army, but are not to be more than thirty in all. That is, there ought to be seventy-five or more, but only thirty can be appointed. Contract dental surgeons are to have the pay of army contract surgeons, \$150 a month and to have the same rights and duties as those "acting assistant surgeons." Contracts will be made with them for three years, terminable after investigation by the Commanding General of a department, or by the Surgeon-General, when he thinks it will be for the interests of the service. Dental surgeons are to be between the ages of twenty-four and forty, and are to pass a professional examination before a board of three examining dental surgeons. This board has been formed by the Secretary of War and contracts with some surgeons have been made, though no dental surgeons have yet been sent to army posts.

Roentgen Ray Institute.—At the Dermatological Clinic of the University of Berlin an institute for light treatment and for Roentgen-ray therapy has been opened under the directorship of Professor E. Lesser.

University of Havana.—Dr. Aristides Agramonte, formerly Chief of the Bacteriological Laboratory, has been appointed to the Chair of Bacteriology and Experimental Pathology in the Medical Faculty of the University of Havana, Cuba.

Suffolk District Medical Society.—At the last regular and annual meeting of this Society,

held at Boston April 27th, Dr. Franz Pfaff read a paper on the "Teaching of Therapeutics"; and before the Surgical Section Dr. C. L. Scudder read a paper on "Strangulation of the Testis by Torsion of the Cord"; Dr. J. W. Elliot, "Report on Two Cases of Strangulation of the Intestine by Bands"; Dr. F. G. Balch, "Report of a Case of Intussusception."

Obituary.—Dr. Ginlo Bizzozzi of Turin, widely known as an investigator in histological and pathological lines, died April 8, 1901. He was born in Lombardy in 1846 and studied medicine in Pavia, Zürich and Berlin. In 1872 he was appointed Professor of Pathology in the University of Turin. His investigations on the blood, connective tissues, bone-marrow, lymph-nodes and dural tumors are classical. Many of the ablest investigators of the present time in Italy were his pupils, Golgi, Tizzoni, Foa, Canalis, Morpugo and others.

Dr. Richard C. Baker, of 75 Lee Avenue, Williamsburg, who was secretary of the Brooklyn Health Department under Mayors Chapin and Boody, died last week of tuberculosis, aged fifty years. Dr. Baker was born in Otsego and was graduated from the University of New York in 1874. He went to Williamsburg, where he built up a large practice and for many years was prominent in Democratic politics.

Dr. George Cogswell died at Haverhill, Mass., April 21st, aged ninety-three years.

OBITUARY.

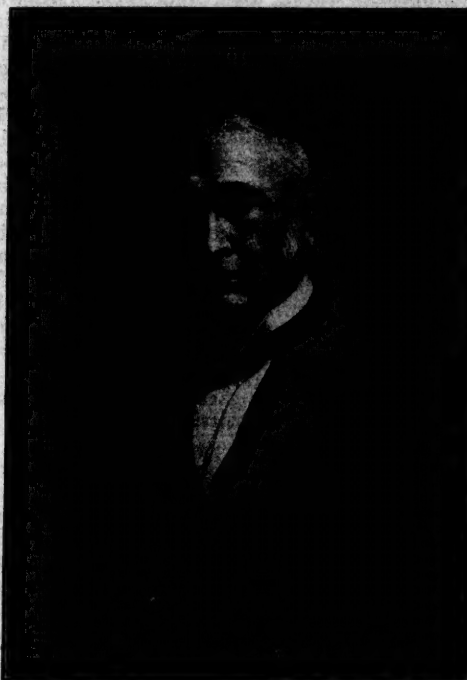
WILLIAM HENRY DRAPER, M.D.

Dr. William H. Draper died Friday morning, April 6th, at his home. Pneumonia was the cause of death, but for more than a year past he has been in failing health. Dr. Draper was for many years one of the best known and most prominent physicians in New York. He was notably a general practitioner in medicine. Next to his standing as a general practitioner, Dr. Draper was a teacher of medicine. Hundreds of students listened to him and learned from him more than they were able to learn from any other instructors, not only because of what he taught—many taught as much—but owing to his way of teaching.

Dr. Draper was born in Brattleboro, Vt., on October 14, 1830, and came early to this city. He was a musician and he utilized his accomplishment as an aid in acquiring his education, serving as an organist in St. Thomas's Church when it was at Broadway and Houston Street, on the site now occupied by the cable building of the Metropolitan Street Railway Company. He studied at Columbia College, from which he was graduated in 1851. He was graduated in medicine from the College of Physicians and Surgeons in 1855, and in the same year received the degree of master of arts from Co-

lumbia. He went to Europe then and studied in Paris and London. Returning to this country, he was appointed in 1869 clinical professor of diseases of the skin at the College of Physicians and Surgeons. He was at that time regarded as a specialist in diseases of the skin, but that was as near as he came to being a specialist. He never took up a specialty as the term is understood by medical men nowadays. He retired from this professorship in 1879 and in the following year he was appointed professor of clinical medicine. He held this post until 1888, when he resigned and was appointed emeritus professor.

He was a trustee of the College of Physicians and Surgeons before it was merged with



WILLIAM H. DRAPER, M.D.

Columbia, and in 1889 he was elected to serve the university until his death.

Dr. Draper's connection with the New York Hospital was a long and interesting one. He was appointed attending physician in 1862 and continued to act as such until 1889, when owing to illness he resigned and was appointed consulting physician. But he got lonesome after all his years of active service as attending physician, and resigned as consulting physician in 1893 to be appointed attending physician again. It was a very rare thing for a physician to do, to resume active work. Dr. Draper served as attending physician until 1900, when he resigned, and he was then again appointed consulting physician. This makes his service of the institution one of thirty-nine

years, five years longer than that of Dr. James McLane, Dean of the College of Physicians and Surgeons, and nine years less than that of Dr. Markoe.

In addition to the New York Hospital Dr. Draper was connected with St. Luke's, the Presbyterian, Trinity, Roosevelt Hospitals, the New York House of Mercy and the Northwestern Dispensary. He was appointed attending physician at the Roosevelt Hospital upon its organization in 1871 and resigned in 1897, whereupon he became consulting physician there. He was President of the Medical Board of Roosevelt in 1883.

Dr. Draper made a trip of inspection to the Peninsula in connection with the Sanitary Commission during the Civil War. He was at one time President of the Alumni Association of the College of Physicians and Surgeons. In 1886 he was President of the College of Physicians and Surgeons and President of the Academy of Medicine. He belonged to the Academy of Medicine, the County Medical Society, the Pathological Society and the Physicians' Mutual Aid Association. In his early life he was a special student under Dr. Willard Parker, serving, under the custom of the time, as Dr. Parker's assistant, being succeeded in that post by Dr. E. W. Lambert, who with the late Dr. Henry B. Sands was an associate of Dr. Draper's for many years, these three well-known New York physicians having been born within a few months of one another. Dr. Draper before going to Europe in the fifties was an interne at Bellevue Hospital.

The ablest summary of Dr. Draper's personal attainment is that given by Dr. William Osler in an editorial notice in the *New York Sun*, which we here give entire.

"Tender memories and keen regrets will be awakened in the minds of many physicians all over the country at the news of the death of Dr. William Henry Draper. It has been given to a few men to adorn the profession with greater graces of the head and of the heart. He belonged to that rare group of men whose daily routine is a benediction, and whose very presence is a benison.

"As a teacher Dr. Draper had a keen sense of proportion in the subjects under discussion, and the merit of lucidity. One felt, too, in listening, a trustfulness in his honesty, and a faith in his convictions. A voice of uncommon sweetness, a singularly attractive face, and a winning manner lent special charms to him as a speaker.

"While not a voluminous writer he made many and valuable contributions to the literature of his profession. With the late Dr. Seguin he introduced the study of thermometry in this country. On the subject of gout and disorders of metabolism in general, Dr. Draper wrote as one having authority.

"But it was as a practitioner and

consultant that Dr. Draper will be long remembered. He had in full measure 'that wisdom which results from combining knowledge with the instinct and skill for its useful application'—words which he himself used in describing the modern practitioner of medicine. Of his generation it would be difficult to name a man more beloved by his patients or more esteemed by his pupils and his colleagues. I express the feelings of his professional brethren in the Association of American Physicians, of which he was a founder and one of the early Presidents, when I say that in our discussions we listened to no one with greater attention, and the younger men among us looked on him as in all respects the ideal physician. Rare grace of presence, with a quiet dignity and reserve, made him a marked man in our gatherings, and his genial and unfailing courtesy and sweetness of manner gave him an unrivalled popularity. 'The too, too slow relief of lingering fate' he bore with a becoming patience and equanimity, and while restful death came to him as a longed-for friend, to us the joy in his release is tempered with sorrow at the thought that we shall see his face no more."

CORRESPONDENCE.

OUR LONDON LETTER.

[From Our Special Correspondent.]

LONDON, April 22, 1901.

THE REFORM OF THE BRITISH MEDICAL ASSOCIATION—PRIVILEGES OF ITS MEMBERSHIP—ITS SCIENTIFIC WORK—ITS POLITICAL WORK—THE SLOW GRINDING OF ITS MILLS—CAUSES OF THE PRESENT DISCONTENT—THE COUNCIL AND THE MEMBERS—THE CENTER OF GRAVITY IN THE GOVERNMENT OF THE ASSOCIATION—A "NAPOLEONIC LEGEND" IN THE ASSOCIATION—THE FRAMING OF A NEW CONSTITUTION—A BATCH OF DECORATIONS FOR MEDICAL MEN.

AMONG the medical questions of the day here may perhaps be counted the reform of the British Medical Association. I say "perhaps," because although a good half of the medical profession in these islands belong to that body, very few take any particular interest in its affairs. For a subscription of a guinea (about four and a half dollars) members get a good medical journal, and the right to attend an annual meeting in which the Horatian precept as to blending the agreeable with the useful is fulfilled by a judicious mixture of scientific papers and picnics. With these privileges the bulk of the members of the Association are content. They receive their *Journal*, which they do not read, but the sight of which seems to give them a sense of satisfaction akin to that felt by a Eunuch in the possession of a harem; and they go year after year to Edinburgh, or Birmingham, or Cheltenham.

ham, to keep their brethren informed of their continued existence and to proclaim *urbi et orbi* their most recent inspiration as to the treatment of a colic or the curve of a catheter. Beyond such simple joys they look for nothing from the Association.

Owing mainly to the popularity of its *Journal* the Association has for a long time been steadily growing in prosperity, and it has a surplus revenue which for some years has averaged £4,000 (\$20,000). It has bought itself a considerable amount of real estate, including a large house in the most central part of London, Charing Cross, where even last century there was to be seen, according to Dr. Johnson, "the full tide of human existence." In that house there are not only offices for the transaction of the business of the Association, accommodation for the editorial staff and composing-rooms, but a considerable library which only needs a little more enlightened liberality in its management to become one of the most important in the Kingdom. In this library besides opportunities (in Matthew Arnold's phrase) of learning the best that is said and done in the medical world, members can write letters, transact business and interview friends as in a club. These varied advantages are greatly appreciated as is shown by the large and ever-increasing number of its members who avail themselves thereof.

The British Medical Association, as is set forth in its articles of association, was established for "the promotion of medical and the allied sciences, and the maintenance of the honour and the interests of the medical profession." The former of these purposes is fulfilled by the foundation of scholarships for the encouragement of original research and by grants in aid of special investigations; subventions are also given from time to time to the Jenner Society (which is the defender of the true faith against those whom Jenner himself called the "antivacks"), the Liverpool School of Tropical Diseases, the Congress of Tuberculosis, etc. The amount spent for such objects in 1900 amounted to more than £1,000 (\$5,000). From time to time, too, committees of investigation on such matters as cancer, inebriety, the decay of children's teeth, the eyesight of railway servants, anesthetics, etc., are appointed, all of which involve more or less expense. Whether the Association gets adequate value for its money may be doubted. The Anesthetic Committee, for instance, sat for ten years, and after this prolonged incubation produced a report which though imposing in bulk and "horribly stuffed," as Iago says, with statistics, is scientifically and practically an addled egg. An elaborate "collective investigation" on cancer was equally barren of any solid result. Some years ago there was a Committee on Hypnotism which presented a report that was quietly suppressed by the Council as being likely to make the heathen blaspheme. An inquiry on the alcoholic question not only failed to throw much light on the matter, but stated its results with such curi-

ous infelicity of expression that the British Medical Association has ever since been quoted as teaching that abstainers are inferior to moderate drinkers in regard to expectation of life. Nor has the work done by the research scholars been as a whole of any great importance. The fact remains, however, that the Association spend a considerable sum of money each year, according to its lights, in the furtherance of scientific inquiry, and it is its misfortune, rather than its fault, that it has not yet found a mute inglorious Pasteur or Koch to whose genius "by poverty deprest" it could give the means of soaring.

With regard to its work in what may be called the political sphere, it must in fairness be admitted that the British Medical Association has on the whole done good service not only for the profession but for the public. Early in its career when it was comparatively a small and unimportant body it was instrumental in getting the first Vaccination Act passed in this country. It played the part of midwife in the process of legislative labor which ended in the birth of the Medical Act of 1859, and it may be called the actual begetter of the Act of 1886, the medical dispensation under which we now live and have our professional being. To the Association is mainly due such improvement as has in recent years been effected in the status and pay of the medical officers of the army, and it has taken an active part in the promotion of many useful reforms in our Poor Law, sanitary and lunacy administration. And its unostentatious work in adjudicating on ethical points and in supporting doctors in the public service against the insolence of office should not be forgotten.

But it may justly be said of the British Medical Association that its mills grind very slowly. Its committees as a rule meet but once a quarter, and a vast amount of time is lost in picking up the threads left loose at previous sittings. This fact lends some color to the charges of inefficiency and want of vigor brought against it by its critics. These consist of a few ardent spirits who think that things in general need reforming and they are the persons to reform them, with the usual following of busybodies in search of advertisement, malcontents whom in the words of Carlyle "no man's endeavour would satisfy," and cranks who are on principle "agin the government." The Association is governed by a Council the members of which are for the most part elected by the Branches between sixty and seventy in number; there is, however, a small number of former office bearers who have the title of Vice-President and as such have seats in the Council. These form but an insignificant proportion of the Council, and not many of them take the trouble to attend meetings so that their influence on the government of the Association is infinitesimal. Personally the Vice-Presidents are highly estimable old gentlemen, most of whom have grown grey and intellectually somewhat fossilized in general practice. Such influence as they have is derived from their character

as *virī pietate graves*. But there appears to be a pretty widespread feeling that they should no longer even in an ornamental sense have seats at the Council board. It is plain enough that this feeling has no nobler source than the jealousy which led the Athenian of old to vote for the ostracism of Aristides because he was tired of hearing him called "the Just"; but unworthy as it is, the feeling must be reckoned one of the forces making for revolution within the Association. Something of the same feeling is extended to the Council as a body, which is charged with many high crimes and misdemeanors, all of which may be summed up in the allegation that it is too conservative and is obstinately opposed to all reform.

There has, of course, always been a party who denounced the Council and all its ways, on the general political principle that it is the business of an opposition to oppose. But this party was till recently too insignificant, qualitatively as well as quantitatively, to have any weight either with the bulk of members of the Association or with the profession at large. They used to go to the annual meetings and pass resolutions which the Council treated as the protagonists of Greek tragedy receive the admonitions of the Chorus. It had never been clearly determined where the center of authority in the Association really was, and the Council having the reins in their hands acted on Bismarck's principle *Beati possidentes*. As the tide of agitation seemed to be rising, they deemed it prudent last year to have the power they had usurped confirmed by legal opinion. They accordingly sought counsel of an oracle of the law who to their surprise and discomfiture reversed the action of Balaam and cursed what he was called upon to bless. With the fatuity which, according to the ancient maxim, is sent by the higher powers upon those whom they mean to destroy, the Council concealed the opinion that they had got from their lawyer long enough to give rise to the impression that they wished to suppress it altogether. Driven to bay at last, they appealed to the *plebs* of the Association in special meeting assembled only to be ignominiously routed.

From first to last the Council, or rather its inner ring of active rulers, have shown a spirit of shuffling and evasion which has naturally produced the worst possible effect by giving rise to the notion that there were all sorts of misdoings to hide. As a matter of fact the affairs of the Association have been conducted with perfect integrity, and the only faults that can fairly be laid to the charge of those responsible for its management have been want of judgment, activity and intelligent initiative. But, though there have been no crimes, there have been many blunders, and they have too often been blunders of the kind that Napoleon said were worse than crimes.

The readiness to believe evil of the powers that be in the Association is a legacy inherited by

the present from a past generation. As Shakespeare says, "The evil that men do lives after them"; though in this case it cannot be said that the good has been interred with their bones, for, oddly enough, there is now a marked tendency (in ill-informed quarters, it is true) to give the *ex hypothesi* illustrious dead vastly more credit than is due to them. As there is a revival of the Napoleonic legend in France, there are signs of a revival of a corresponding legend in connection with the British Medical Association. The coincidence is made all the more remarkable by the fact that the hero of the legend when alive rejoiced greatly in the description of "the Napoleon of medical journalism" which in an ill-inspired oratorical flight was bestowed upon him by an American post-prandial speaker.

The legal decision that the Association, being registered under the Companies Act is in the same relation to its members that a commercial enterprise is towards its shareholders, placed its destinies in the hands of the annual meeting. As this is simply a fortuitous concourse of atoms, which is usually attended only by the officers of the Association and a handful of cranks, it was obvious that at any time by judicious lobbying a snatch vote might be passed by which the whole concern would be wound up or the Association committed to homeopathy, antivaccination or any other folly. Something had to be done, and Mr. Victor Horsley came forward as a savior of society and proposed the appointment of a Committee to frame a new constitution for the Association which was showing signs of tumbling *mole sua*. This committee sat through the winter and drew up an unwieldy scheme of reform which is now being discussed by the Branches. In a future letter I will give an outline of the scheme, which as far as can be gathered from the voting up to the present, will be accepted. It should be said, however, that only an inconsiderable fraction of the Association take any interest whatever in the reform.

TRANSACTIONS OF FOREIGN SOCIETIES.

French.

TUBERCULOSIS—SPINAL ANESTHESIA—PUERPERAL INFECTIONS—PRIMARY RESECTION OF THE DIAPHYSIS OF THE HUMERUS.

ROBIN, at the Académie de Médecine, March 19, 1901, discussed the subject of the conditions and diagnosis of tuberculosis among mankind, basing his observations upon the results of data secured by Binet and himself, through several years past, of 392 patients. The facts enunciated tend to combat many of the false notions about tuberculosis held by the laity and physician alike. For example, it is held that the usual lung activity of the tuberculous is far below that of the normal chest, whereas the opposite is the rule. Consequently the practitioner is desperate in his efforts to increase the oxidizing functions. In 162 cases carefully determined in

only 8 per cent were these conditions found to be correctly diagnosed in the popular notion. The variation from the falsely-assumed rule may be summarized as follows: Pulmonary ventilation increases about 110 per cent. in the female and 80.5 per cent. in the male; carbonic acid exhaled by the kilogram of weight and by the minute increases by 86 per cent. and 64 per cent. respectively in the woman and man; total oxygen consumed to the kilogram-minute increases in the female 100.5 per cent., in the male 70 per cent.; total oxygen absorbed by the tissues rises by 162.8 per cent. and 94.8 per cent. each in the female and the male sex. This superactivity of the pulmonary changes is present also in the acute stages and forms of the disease, and is always openly manifested in the chronic cases. It accompanies alike the periods of invasion, of advance and even of fatal termination up to almost the last moments. It is capable of oscillations which tend to show those periods which mark the advance, quiescence and recurrence of the process. Sufferers from tuberculous spondylitis, osteitis, osteomyelitis, orchitis, pleuritis, and adenitis, all conform to these rules of greater activity of the body-changes. They are, however, absent in the presence of peritonitis, meningitis and lupus of tuberculous character. There are several diseases and conditions which are accompanied by an exaggeration of the respiratory function, but in such the nature of such variations differs from that in phthisis. Therefore, if one hesitate about diagnosing tuberculosis, a study of the respiratory changes will be likely to establish the question and since they occur with the invasion it will be possible to do so very early in the disease. The exaggeration of the respiratory function does not appear to be an act of defence by the system, nor a sign of the attack of the bacilli, since it exists in three-fourths of the offspring of tuberculous parents before any disease has appeared. In conditions regarded as antagonistic of tuberculosis, for example, arthritis, the respiratory functions are less than normal. These respiratory exaggerations may, therefore, be regarded as one of the ground or soil elements for tuberculosis and one of the others is the disintegration of the tissues, so that with Hippocrates we may regard tuberculosis as a consumption. It is this hyperoxidation and demineralization of the tissues which constitutes the soil for the invasion of the disease. The prophylaxis and cure of tuberculosis does not rest entirely with the means, public and private, commonly adopted against it. It consists in selecting persons probably susceptible to it and putting them under such hygienic and therapeutic influences as will tend to counteract the invasion of the bacilli.

RECLUS in reading a paper, collaborated with TUFFIER, on the subject of general anesthetization with cocaine injected into the spinal canal, dwelt briefly on the details of the technic and its dangers and difficulties. In the first place it is not easy to enter the subarachnoid space always.

Then, when the injection has been made the actual anesthetic effects may be very much delayed, entirely absent, very imperfect or very ephemeral. In addition to these which might be dismissed as insignificant are those which are certainly within the category of serious sequelæ. Among such are severe headache persisting many days and causing insomnia; paresis of either or both lower extremities, also apt to continue a long time; failure of rectal and vesical control, both during and after the operation; nausea and vomiting which have been known to exist for many days; muscular tremors or general trembling have been seen. All these one author claims can be disregarded when one considers the dangers of ether and of chloroform narcosis, but such is not the truth. Out of a total of only 2,000 spinal cocaineizations six, possibly eight, deaths are to be attributed to the cocaine alone, although small doses were employed. Among many thousand records chloroform shows 1 death in 2,300; ether, 1 in 7,000; subcutaneous injections of cocaine, 1 in 7,000. Hence one must conclude that these three last named are the best anesthetics for all-round surgical use.

LABORDE, at the meeting of March 26, 1901, continued the subject by stating that for several years he has made experimental cocaine injections into the arachnoid space with special reference to its hazards and has concluded that these are so real that the method should be abandoned for ether and chloroform narcosis. The dangers encountered are due either to deleterious local effects of the injection upon the nerve substance, or to absorption of the drug and diffusion of it through the spinal fluid so that the bulb is reached. Then occur the profound circulatory and respiratory depressions, the nausea and the vomiting, the severe headaches and so on, according as one or another center is affected. Consequently the method should be proscribed as too dangerous.

RICARD, at the Société de Chirurgie, March 13, 1901, spoke of the indications for operative interference in cases of puerperal infection and said that the primary step consists in determining the character and the extent of the lesions. The cases come usually within two categories. There are such as have a local peritonitis or lesion. Treatment must therefore comprise a determination of the limits and locus of such lesions and an appropriate operative intervention according to the findings. There are also those cases which are in fact a general peritonitis. In these treatment must be concerned with deciding whether or not to interfere at all and if so the fitting time and procedures of it. The total statistics of the French accoucheurs comprise about 2,640 cases of puerperal infection. Of these 105 were fatal. Of the grand total 805 showed a temperature of 39° C. or above, which would make the mortality-rate among them 13 per cent. In general terms the rate of mortality among the French in this class of cases is about 10 per cent. and this without any intervention.

except that which the usual methods comprise, that is no hysterectomy. After gathering all these statistics and carefully studying them, he has not been able to find one single indication among all the number which might be regarded as definite for hysterectomy. Upon the basis of this evidence he does not hesitate to declare against hysterectomy unless a very definite indication can be obtained from the circumstances of the case. In general terms the ordinary treatment of puerperal infection is adequate.

PICQUÉ, in behalf of Studer (Vernon) and Radouan (military surgeon), reported a case of gunshot wound of the humerus necessitating primary resection of the diaphysis for an united fracture. The result obtained by these two observers in this case was very excellent and satisfactory. He went on to relate a case of his own in which a crushing accident had been followed by pseudarthrosis between the two fragments of the broken humerus. Apparatus applied had proved most unsatisfactory and he had thought that a primary resection of the diaphysis would have been more advantageous. Nélaton said that in the matter of primary diaphyseal resections of the humerus it was impossible to formulate any fixed rule. In the first place it is necessary always to spare the skeleton as much as possible and to content one's self with the removal of splinters of bone and the smoothing and apposition of the larger pieces.

SOCIETY PROCEEDINGS.

ASSOCIATION OF AMERICAN PHYSICIANS.

Sixteenth Annual Meeting, Held at Washington, D. C., April 30 and May 1 and 2, 1901.

FIRST DAY—APRIL 30TH.

President's Address.—Dr. William H. Welch said that the day for formal addresses before such a body as the present one had gone by and on this, the sixteenth anniversary of the Association, he wished to allude only to a few points of present moment. He contrasted the present splendid opportunities in American medicine with those of fifteen years ago when this society had its birth, but, he added, the growth had not progressed along symmetrical lines. To-day, the opportunities for research and laboratory work in anatomy, and pathology and the more strictly technical branches of medicine were unexcelled in any country in the world and the strongest feature in the developmental history of the teaching of medicine in the United States was the superb opportunity offered in laboratory research, but that the scientific post-graduate work in clinical medicine had not been developed as it should be. In clinical medicine the few years in the hospital and others in dispensary work

now afforded did not give that opportunity for careful clinical work which was the regular routine in the universities of Europe. The further development of the post-graduate work as hospital residents was a step that our teachers should encourage. In speaking of the overcrowded condition of the society, with practically no vacancies and a pressing waiting list, he called the attention of the members to the advisability of acting on Dr. Da Costa's suggestion of placing those members who were not in active membership on the honorary roll and thus permit the younger and more active members of the profession to enter their ranks. In a few admirably chosen words he spoke of those members who had died during the past year—Drs. J. T. Whittaker, J. M. Da Costa, S. C. Bussey and W. H. Draper.

Official Business.—The Reports of the Secretary and Treasurer were read and the names of ten applicants for membership were presented to be voted on. These were Drs. C. L. Greene of St. Paul, Wm. T. Howard, Jr., of Cleveland, George Blumer of Albany, Alfred S. Warthin of Ann Arbor, J. J. Kinyoun of U. S. Marine-Hospital Service; E. K. Dunham of New York, J. L. Morse of Boston, H. Jackson of Boston, A. R. Edwards of Chicago; for honorary membership, Dr. Charles F. Folsom of Boston.

Slow Pulse and Stokes-Adams' Disease.—This paper by Dr. Robert T. Edes of Boston was read by title.

Undescribed Cardiac Sound.—Dr. H. A. Hare of Philadelphia described a peculiar vibration occurring at the systolic interval, one inch to the right of the sternum, and one inch to the left of the nipple on the nipple level which did not correspond to any sound with which he was acquainted. It resembled, in part, a pericardial friction sound, but was dryer and was due to the contractions and vibrations of the chordæ tendinæ, especially when the heart muscle was not perfectly normal. In certain ways it closely resembled the sound "ching," short and quick and not too crisp. It was increased by mental excitement and fear, but not by muscular exercise.

Diagnostic Significance.—He had come to regard it as evidence of impaired myocardial action and had found it frequently following influenza, in the depressed physical condition. In the beginning of pulmonary tuberculosis it was a valuable diagnostic sign. It was not a subjective cardiac symptom.

In discussion Dr. Osler said he thought that possibly the sound was to be interpreted either as the first sound, with a peculiar crunching character or it was the delicate sound, slightly grating, which is frequently found at the apex resembling a pericardial friction sound.

Flint Murmur in Aortic Insufficiency.—In speaking of the frequency and the diagnosis, Dr. W. S. Thayer of Baltimore referred to the murmur first described by Flint in 1862; this was presystolic and limited to the cardiac apex.

The sound was loud and blubbery and had all the characters of a mitral, direct presystolic murmur. In view of the fact that Gibson, in his recent text-book, says that he had not encountered this condition, Dr. Thayer had made a complete analysis of the cases presenting Flint's murmur in the wards of Dr. Osler in the Johns Hopkins Hospital. Since May, 1889, 74 patients with aortic insufficiency came to autopsy. In 45 of these there was heard at some time a rumbling, echoing murmur in diastole, limited to the region of the apex, and differing from the diastolic murmur of aortic insufficiency, *i.e.*, a murmur similar to that of mitral stenosis. It was presystolic in time and ended abruptly in a first sound or a systolic murmur. In 12 of these 45 cases there was a mitral stenosis associated with the aortic lesion. The results of an examination of 58 cases of aortic insufficiency showed that 33 had the Flint murmur. In 17 out of the 33 cases in which a Flint murmur was observed, the mitral valve was normal. Dr. Thayer propounds the question whether it is possible to distinguish positively the cases of aortic insufficiency with Flint murmur from those complicated with mitral stenosis during life. The more characteristic physical signs of mitral stenosis are the pulse, the sharp systolic shock at the apex, the presystolic or mid-diastolic apex thrill and murmur, and the sharp valvular first sound in the apex region. An analysis of the physical signs in 22 cases of uncomplicated mitral stenosis shows that the thrill was present in 54½ per cent., a sharp, systolic shock and snapping first sound in 68 per cent. and a presystolic murmur in 81 per cent. of the cases. A comparison of the cases with mitral stenosis and aortic insufficiency combined shows no very great differences except with reference to the sharp shock of the first sound.

Combined Lesions.—The tables quoted by the author bring out certain clearly marked clinical differences between the cause of aortic insufficiency with Flint murmur and those complicated with true mitral stenosis. The character of the murmur differs only in that the Flint murmur is never as rasping and intense as are the more marked murmurs of true mitral stenosis; it is commonly echoing and of moderate intensity. A large proportion of cases of true mitral stenosis, however, show similar slight thrills. The presystolic thrill is less frequent and less intense. In but a very small number of cases of aortic insufficiency with Flint murmur does the apex beat have the tapping character so significant of true mitral stenosis.

History of Cases Important.—In the 33 patients with Flint murmur there was a clinical history of acute rheumatism or chorea in but 13. In more than half there was clinical evidence of general arteriosclerosis although arteriosclerotic changes offer no diagnostic features, being as common in one

type as another, whether the Flint murmur is absent or present. Arteriosclerotic lesions are usually located at the aortic orifice; in endocarditis the greater prevalence of mitral involvement is important.

Diagnosis.—A positive diagnosis of functional mitral presystolic murmur is difficult to make as it may differ in no way from true mitral stenosis. In true mitral stenosis, however, even if complicated with aortic insufficiency, the tapping systolic shock and the snapping first sound are common. On the other hand, the Flint murmur is associated usually with the characteristic heaving impulse of aortic insufficiency and the dull ill-defined, prolonged first sound. In cases of Flint murmur the pulse is usually wholly characteristic of aortic insufficiency. The diagnosis of Flint murmur is fairly safe when a presystolic murmur in the region of the apex is present in aortic insufficiency occurring in individuals with well-marked arteriosclerosis, especially in the absence of history of any acute malady ordinarily associated with the development of an endocarditis.

Dr. Cabot of Boston, from the results obtained in the wards of the Massachusetts General Hospital, bears out Thayer's results. In 10 patients coming to autopsy, showing during life this murmur, there were normal mitral valves.

Cause and Clinical Features of Cardiac Hydrothorax.—Dr. Alfred Stengel of Philadelphia limited his paper to the discussion more particularly of right-sided hydrothorax. Most writers regard pleural dropsy of cardiac disease as bilateral or unilateral only when one pleura is bound down by adhesions. In the study of 100 patients with cardiac disease he had 17 with hydrothorax. Five of these were right-sided alone, 3 left-sided, in two of which the right pleura were adherent. Nine were bilateral at one stage or other of the process. Two began as right-sided hydrothorax and then became bilateral, the others started as bilateral lesions.

Etiology.—The reason for the marked preponderance of right-sided lesions does not appear to be an accidental one. Stengel discards all the inflammation theories and supports those based on anatomical causation. The condition may be due to obstruction to the lymph channels or what is more probable to pressure on the venous circulation, more particularly to some mechanical obstruction to the vena azygos major.

Clinical Forms of Heart Disease Showing Hydrothorax.—From autopsy findings the author had found this condition in 73 per cent. of the cases in which there was mitral disease and only 17 per cent. in which tricuspid disease was present. Hence the enlarged right heart due to mitral lesions might be regarded as an efficient cause of pressure on the azygos vein. The difference in anatomical configuration of

the right and left sides might be regarded as influencing this one-sided involvement.

In the discussion Dr. Osler said that the cause of the affection pointed clearly to a local affection because of (1) its chronicity, the affection lasting for years and recurring year after year; (2) because there is absence of edema in other parts of the body, and (3) because it is almost invariably right-handed.

Dr. J. C. Wilson of Philadelphia said that when the affection was bilateral it was frequently due to renal causes; he also said, in discussing the cardiac cases, that probably the anatomical fact that the heart, itself, occupied such a large part of the left pleural cavity was sufficient reason why the right pleural cavity was oftener affected.

Dr. E. G. Janeway of New York, in commenting on the difficulties in diagnosis, reported a case of typical right hydrothorax without valvular lesions, which was diagnosed by one eminent consultant as tuberculous in origin; by another as not a case of heart disease; by a neurologist as a case of Bright's disease, as renal symptoms had appeared in the meantime. An autopsy developed the fact that the patient had had a myocarditis fibrosa and died with a thrombus in the left ventricle.

Dr. A. Jacobi spoke of the frequently unrecognized occurrence of myocarditis diagnosed as mitral disease. The possibility of local myocardial degeneration should be borne in mind. This alone might induce a local hydrothorax.

Chronic Myocarditis and Fatty Degeneration of the Heart.—Dr. Beverley Robinson of New York City said that clinically these two conditions of cardiac degeneration are frequently most difficult to differentiate. The symptoms denoting cardiac weakness are slowness of the heart sounds at times, alternating with extreme rapidity, with sensations of fluttering and cardiac distress. Sometimes there is a systolic murmur. Attacks of dizziness or faintness may come on rapidly and repeat themselves with little or no sufficient cause. The pulse is often faint and there is an occasional lapse of one or two beats. This type he believes is due to a beginning fatty degeneration and are best treated by iron and arsenic in order to restore the anemic blood condition which is an invariable precursor. Intestinal antiseptics are also of service. Strophanthus and strychnine are demanded at the time and the systematic use of oxygen is beneficial.

Causes of Cardiac Degeneration.—These were dwelt on at some length. Obesity, senility, muscular exertion, gout, and syphilis were all discussed as factors in the causation of these destructive heart lesions. In senile hearts, among those who have led moderately careful lives the changes are apt to be a fibrous rather than of the fatty type, if the heart begins to show decided weakness, irregularity and intermittency. With these conditions there may be moderate enlargement—usually hypertrophic dilatation. The arteries are apt to be thickened and tortuous.

The urine, while not showing any sugar or albumin, is ordinarily of low specific gravity and the whole quantity is diminished. With fatigue or dietary indiscretions, prolonged exposure to heat or cold the heart is apt to make the patients suffer. They sleep poorly, bronchitis may develop, and they frequently have faint and dizzy spells. These patients are those suffering from myocarditic changes.

Hemorrhage from Pleural Abscess.—Dr. A. Jacobi of New York reported a case of empyema occurring in a child of three years of age. Rib resection was practised and after 500 c.c. of pus had been evacuated a large hemorrhage occurred which was checked by packing with gauze. The hemorrhage was very profuse and came from a number of disseminated tufts arising from the pulmonary pleura. These tufts varied in size from mere pinheads to $\frac{1}{2}$ cm. in diameter. The treatment by compression was satisfactory and the child ultimately recovered. He believed the case to be unique, as it seemed that the most important etiological factor, tuberculosis could be ruled out.

Cyst of the Omentum.—Dr. Jacobi also presented a specimen of simple cyst of the omentum occurring in a child two years of age. The affection was at first diagnosed as tuberculosis of the peritoneum and the abdomen was repeatedly tapped, with success, for a year. The tumor recurred and again subsided after tapping. On the appearance of inflamed axillary lymph-nodes, a laparotomy was performed and an enormous cyst was removed by Dr. Weir. This proved to be a simple uncomplicated cyst of the omentum, attached by two pedicles with numerous channeled cystic cavities. The child made a complete recovery.

In discussing Dr. Jacobi's first case Dr. J. P. Henry of Philadelphia remarked that, inasmuch as tuberculous pleurisy was very common and hemorrhage of the pleura was rare, tuberculosis could not be rightly considered as the main cause of hemorrhage of the pleura. In his experience scurvy was the most important etiological factor.

Dr. G. L. Peabody of New York said that there were undoubtedly many cases of hemorrhagic pleuritis which were never diagnosed because they recovered. Many of them might be tuberculous and yet not be diagnosed as such. Many cases diagnosed as pleurisy with effusion showed hemorrhage on tapping.

Dr. Osler commented on the fact that it was in the early stages, when the fresh tubercles were being formed, that hemorrhage was apt to occur.

Pneumonia with Remarkable Exudate.—Dr. Charles Cary of Buffalo reported a most remarkable case of extensive pseudomembranous exudate occurring in a case of acute lobar pneumonia in a boy eleven years of age. The disease began as a simple tonsillitis, with sore and reddened throat, no membrane and negative bacterial findings. The boy subsequently developed a temperature of 103.5° F., and the lungs finally became consolidated. The picture was that of an acute

double lobar pneumonia. A thick, tenacious, fibrinous exudate formed in the mouth and fauces and on the nasal mucous membrane. This the boy would pick off and beneath the exudate there would be left a raw, granulating surface. A similar membranous exudate developed over the glans penis, but this did not extend into the urethra. There also developed a marked tympanites and a similar membranous exudate was found on the mucous membrane of the rectum. A fibrinous pleurisy was also diagnosed.

Pneumonic Character of Exudate.—Microscopical examination of the exudate showed it to be composed of fibrin and pus and there were numerous diplococci of pneumonia. Streptococci were also present, but the bacillus of diphtheria and Neisser's gonococcus were absent. Animal inoculations demonstrated the pneumococcal character of the infecting agent. The patient ultimately recovered after a three months' illness.

Pernicious Anemia.—Dr. F. P. Henry of Philadelphia reported on a number of cases of pernicious anemia which he discussed at the last meeting of the Association in 1900. He said that the tendency to regard megaloblasts as pathognomonic was unnecessary. The diagnosis was better founded on the general signs and symptoms in addition to the blood findings. Nucleated cells were not indicative of pernicious anemia solely, since they were found in other conditions, notably in *bothriocephalus latus* infection. He felt that a clinical diagnosis was to be preferred to a laboratory investigation; thus bothrioccephalous anemia was not separable by microscopical means from cryptogenic anemia.

Progress of Pernicious Anemia.—Dr. Frank Billings of Chicago discussed similar cases reported by him in 1900. He showed by an admirable series of charts the general progress of a number of cases. Of twenty patients reported ten had died, of the remainder four were under observation. He brought out the fact that with a decided decline in the patient's condition, Van Noorden's crises, there appeared a large number of nucleated red cells, although a few cases did not follow this general law. The continued observation of the cases had not developed any new facts save that the periods of improvement in some were longer than is usually taught in the text-books.

Volume Index.—In view of the uncertainty of blood counts, Dr. Billings in collaboration with Dr. J. A. Capps, of Chicago, had elaborated a new unit, entitled the volume index. This represents a fraction whose numerator is the percentage of red-cell count as determined by the hematocrit and whose denominator is represented by the percentage of red-cell count as determined by the Thoma-Zeiss hematocytometer. This volume index bears a certain ratio to the color index which is the fraction whose numerator is represented by the percentage of hemoglobin and denominator by the percentage of red blood-cells as determined by the hematocytometer.

Spinal Cord Changes.—Dr. Billings reported

on one patient that developed the typical spinal cord lesions of pernicious anemia reported by Nouné, Dana, and other observers. The clinical picture and pathological findings were typical. The spinal cord degenerations as reported on by Dr. L. F. Barker, of Chicago, were mainly confined in the lumbar cord to the efferent tracts—the column of Goll and Burdach, the direct cerebellar tract and Gower's tract. In the cervical cord the lesions were more diffuse, being almost myelitic in character.

Dr. James J. Putnam in discussion asked if the changes in the cord were pathognomonic of pernicious anemia. He was inclined to hold that in other conditions, more particularly of malnutrition, similar cord changes might be found.

Dr. Osler drew attention to a type of spinal cord lesions, preceding the development of the pernicious anemia, as outlined by Risien, Russell, and Battey of England.

Dr. Shattuck of Boston spoke of pernicious anemia following sudden mental shock and reported a case occurring in a healthy woman following the sudden death of a son.

Acute Splenic Miliary Tuberculosis.—Dr. D. D. Stewart of Philadelphia reported an unusual case of acute miliary tuberculosis originating in the spleen. The patient was a trained nurse, who after protracted work with a typhoid case contracted an influenza and before fully recovering commenced to nurse a tuberculous patient. Bad general hygienic surroundings, poor food and reduced vital tone were the probable factors predisposing to the infection. She was sick sixty-eight days and died of acute general miliary tuberculosis with extensive involvement of the spleen. The spleen was first attacked and showed the oldest and most extensive lesions.

Relapsing Fever of Hodgkin's Disease.—Dr. J. H. Musser, of Philadelphia, considered in detail the peculiar relapsing fever of pseudoleucemia, which he regarded as possibly tuberculous in its character, although its remittent type was peculiar and not absolutely typical of that condition. He reported several cases and spoke of some of the prodromata of the fever, as mental irritability, pain in the glands of the groin, anorexia and most obstinate insomnia. The blood was negative and the treatment unsatisfactory.

Dr. W. H. Welch spoke of the gradually growing conviction in pathological circles that a large number, if not most of the cases of Hodgkin's disease were tuberculous in their character.

Blood in Lead-Poisoning.—Dr. Alfred Stengel, described for Drs. C. Y. White and William Pepper of Philadelphia, a type of degeneration of the red cells of the blood which was present in lead-poisoning and which when found offered a diagnostic aid in the study of this affection. It consisted of a granular degeneration of certain elements in the erythrocyte which became manifest by its reaction to certain basic anilin dyes, notably thionin. The granules are small, evenly distributed or clumped, varying from very minute puncta to granules the size of

eosinophile granules, round or club-shaped. They may be found in the normal or irregularly shaped red cell. They are not found in the fresh blood, but require starving technic to make them manifest. Stengel does not regard them as mitotic remnants of the nucleus, but considers them as true degenerations. His experiments included a series of patients with well-marked lead-poisoning, lead workers (clinically sound), cases exposed to high temperatures, and animal poisoned experimentally.

Diagnostic Features.—The granules are always present in well-marked cases of lead-poisoning; the more severe the grade, the coarser the granules. In cases of lead workers the granules were always present although clinically the patients were well. As the patients recover the granules disappear.

Toxic Origin of Neurasthenia and Melancholia.—Dr. M. Allen Starr of New York said that among the many types of neurasthenia there were at least four with fairly well-marked characters: There were those due to anxiety and mental distress; cases due to overexertion and stress; others due to beginning degeneration of the neuron and destined to go on to organic breakdown, and a fourth due to toxic causes. He limited his discussion to this last class. Here there seemed a definite cycle of symptoms; there was headache, fulness in the head, irritable temper, lack of ability to concentrate the attention, irregular flushings; dyspeptic symptoms; regurgitation, eructation, constipation, foul and feculent stools were common. There was a definite mental cycle. From noon until 9 P.M. the patient feels better, from that time the patient gets worse until 4 A.M.; when he awakes he is extremely depressed and remains so the entire morning. At noon greater cheer comes and the cycle repeats itself.

Etiology.—In as much as this definite cycle is manifest it must be dependent on a habit cycle of the patient. This, Starr thinks, is associated with gastro-intestinal absorption and hence the causative agent is of a toxic nature which he believes is formed in the stomach and intestines.

Treatment.—Regimen is paramount. Increased water intake and a diet peculiarly adapted to the individual patient. Drug treatment should be digestant and eliminant. Small doses, $\frac{1}{10}$ gr., calomel frequently repeated and combined with $\frac{1}{4}$ gr. doses of podophyllum, Carlsbad salts and sodium salicylate at morning meal. Intestinal antiseptics with sulphocarbolate of soda, gr. v, potassium permanganate, gr. i; or, salol, gr. v, castor oil, \mathfrak{m} v; or sulphocarbolate of soda, gr. v, sodium benzoate, gr. v; beta-naphthol, gr. v. These remedies should be put up in capsules which pass into the intestine before setting free their contents. This medication will break up the periodicity; baths, exercise and rest will complete the cure.

Addison's Disease.—Dr. W. W. Johnston of Washington presented a man with Addison's dis-

ease, shown last year, who on suprarenal capsule had improved and was now able to do full work.

Neurasthenia and Its Recognition.—Dr. W. W. Johnston used the case of Charles Darwin as an illustration showing how the lack of recognition of the main causative factors in neurasthenia is responsible for many breakdowns and lost opportunities. The diversity of symptoms of the neurasthenic makes him a prey to the narrow-minded specialist, as in this condition there is such a "positive exuberance of symptoms." The treatment of gastric disorders offers but a very limited outlook in the treatment of the condition. Rest is of more value than medication, but of still more value is the education of the rank and file of physicians to the position of being able to recognize the condition.

Need for Sanatoria.—The author holds that there is a distinct need for special sanatoria for the treatment of this condition. Mixed cases should not be allowed and the attendants all should have had a special training. Educational blunders often condemn children to lives of invalidism and the offspring of neurasthenic parents should be carefully and soberly educated.

In discussion Dr. James J. Putnam said that his observations did not bear out the belief in a definite cycle in neurasthenics; cause and effects were extremely variable and difficult of accurate measurement. Well conducted sanatoria were much in demand.

Dr. C. A. Herter of New York referred to intestinal putrefactive products as bearing on the question of a toxic type of neurasthenia. The amount of excretion of ethereal sulphates was an indication of the grade of mental depression. In melancholia they were often much increased. Experiments on indol were referred to, this substance producing such toxic effects as increased nervous irritability and depression. There is a definite relationship which may be posited although perhaps the exact toxic product is not known.

Diabetes, Diabetic Coma and Acid Intoxication.—Dr. C. A. Herter read a highly suggestive and important paper on the relation of acid intoxication to the development of diabetic coma. In order to measure the amounts of organic acid, mainly di-acetic and B oxybutyric acids, he had followed two main methods, one known as the method of balancing acids and bases, the other by estimating the nitrogen of ammonia. In health, by the former method, it is found that, speaking generally, the acids and bases neutralize each other while in diabetes, especially approaching a period of coma, there is a marked increase in the total bases, measured as sodium, which indicates a much larger amount of organic acids with which the basic compounds combine, in order to neutralize the same. The method of determining by the N in NH_3 shows that in diabetic coma the amount of nitrogen is enormously increased.

Prophylaxis of Coma.—Both methods, therefore, afford valuable information bearing on

the developmental history of diabetic coma and offer valuable forewarning of the appearance of this complication. Inasmuch as the amount of sugar in the urine does not show any definite ratio to the amount of organic acids, it is obvious that the ordinary sugar tests afford little evidence on this point. Dr. Herter gave brief summaries of three groups of cases showing the relationship of the excretion of the organic acids to coma. Most cases showing increased amounts of organic acids, reckoned as B oxy-butyric acid, do badly; the reverse is not always true however. In his conclusions he said that the method of balancing acids and bases, as a chemical procedure, offered the best means of determining the exact quantitative relations of excretion of the organic acids; the determination of nitrogen, as ammonia, is useful as a clinical method especially from a prophylactic point of view; an increase of organic acids precedes and is coincident with diabetic coma; crotonic acid is usually present in the urine in diabetic coma; an increase of oxy-butyric acid may be present for a long time, days, weeks or months, before the development of coma, yet if the amount of organic acids in the urine is persistently over 25 grams daily, coma is certain to develop; cases with as much as 30 grams daily of oxy-butyric acid have been known to go about in comparative comfort; the ratio of glucose and acid intoxication is not constant and hence sugar determinations have little prognostic significance; a diminution in the amount of ingested carbo-hydrates usually diminishes the amount of excretion of organic acids.

Metabolism in Diabetic Coma.—Dr. E. P. Joslin of Boston corroborated in a striking manner the results of Dr. Herter in the recital of a case under the observation of Dr. Pfaff and himself. A rigorous alkaline treatment failed to save the patient when in coma.

In discussion Dr. Vaughan said that an excess of nitrogenous food often did harm, especially as these organic acids probably did not come from carbohydrate food.

Dr. Pfaff of Boston said that in the diet of diabetics it is wise to exclude fats very rigorously as most of the acetone is developed from such bodies. The irritation of the kidneys is often due to even very slight amounts of carbohydrates ingested. Acid intoxication is a step nearer the ultimate solving of the problem of diabetes, but underlying all were the deeper mysteries of perverted metabolism.

Dr. Herter said that he did not regard the failure of the alkaline treatment militated against the theory of acid intoxication. The trouble lay in the continued formation of new organic acids; moreover, the frequent success of the intravenous infusion of alkaline salts served to support the doctrine. He said that cutting off nitrogenous diet would be unwise, since, granting that some of the acids might come from proteids, the major portion of the neutralizing ammonia also comes from the proteids.

Classification of Poisons and Intoxicants.

Dr. J. G. Adami of Montreal gave a short dissertation on this subject, claiming that clearer ideas of terminology were of value. He offered a slight modification of Von Jakoch's system of classification.

Demonstrations of interesting specimens were given in the evening by Drs. C. C. Bond of Richmond, Ind.; William F. Councilman of Boston, H. C. Ernst of Boston, S. Flexner and R. M. Pearce of Philadelphia, W. H. Welch, E. L. Opie, W. G. MacCallum and Buckley of Baltimore.

Election of Officers.—J. C. Wilson of Philadelphia was elected President; James Stewart of Montreal, Vice-President; S. Solis-Cohen of Philadelphia, Recorder; Henry Hunn of Albany, Secretary; J. P. Crozer Griffith of Philadelphia, Treasurer; Frank Billings of Chicago, F. P. Kinncutt of New York, Councillors; Wm. Osler of Baltimore, Member of the Executive Council of the Congress and F. H. Williams of Boston his Alternate.

(To be Continued.)

BOOK REVIEWS.

LECONS DE PHYSIOLOGIE EXPERIMENTALE. By Drs. R. DUBOIS and E. COUVREUR. Georges Carré et C. Nand, Paris.

THESE lessons constitute an outline of the work in physiology given to the students of the University of Lyon and are put forth expressly with the purpose of saving the student's time and to relieve him from the task of taking and copying notes.

The work is more than a mere record, however, it is a carefully-prepared and well-illustrated guide to the study and practice of experimental physiology. It is particularly opportune and to be recommended warmly at this time when the methods of observation and experiment are taking the place of the dry-as-dust didactic lecture in some of the more advanced medical colleges of this country.

A PRACTICAL TREATISE ON MATERIA MEDICA AND THERAPEUTICS. By JOHN V. SHOEMAKER, M.D., LL.D., Professor of Materia Medica, Pharmacology, Therapeutics and Clinical Medicine, Medico-Chirurgical College of Philadelphia. Fifth Edition. F. A. Davis, Philadelphia, New York, and Chicago.

DECIDEDLY Dr. Shoemaker's book is very useful. From many points of view it is excellent, from others the reverse. Among its desirable features may be classed its thorough appreciation of the pharmaceutical side of the dispensing of medicines and its richness of practical hints in the use of drugs. Its prescriptions are numerous and well selected and from

a knowledge of a student's needs, we know that they are extremely useful.

The method of grouping drugs is alphabetical. For the student this appears to us to be detrimental to the value of a work of this kind. It, moreover, compels a repetition that is neither desirable nor necessary.

AN INTRODUCTION TO PHYSIOLOGY. By WILLIAM P. TOWNSEND PORTER, M.D., Associate Professor of Physiology in the Harvard Medical School. The University Press, Cambridge, Mass.

THE flood-tide of laboratory manuals has been in evidence in many branches of natural science, but thus far the student of physiology has been more consigned to monumental tasks of memorizing voluminous tomes termed physiologies.

We trust that the example set by Dr. Porter in this simple and accurate volume will be followed by other teachers and that laboratory methods of teaching physiology will be as universal as they are in the cognate branches of anatomy, pathology, and chemistry. The book is a laboratory guide and discusses the methods and why and wherefore of animal experimentation.

A MANUAL OF OBSTETRICS. By A. F. A. KING, M.D., Professor of Obstetrics and Diseases of Women in the Medical Department of the Columbian University, Washington, D. C. Lea Brothers & Co., Philadelphia and New York.

THE art of midwifery differs somewhat from most other branches of medicine in that, from the very nature of things, very radical innovations in practice or theory are hardly to be expected in the course of a few years and though a guerrilla warfare is constantly being waged in the outlying borderlands that are concerned with such minor considerations as the value of antepartum douching, chloroform *vs.* ether, the dangers of the antepartum full bath, methods of treating the cord, etc., there is a gratifying unanimity of opinion on all important points and in the main the process of child-bearing is allowed to go on much in the same way that it has ever since the last great change was made after the discovery of the principle of antiseptics. Therefore the appearance of the present edition of this well-known handbook so closely on the heels of its predecessor must be taken, not as evidence of the rapid progress of the science it deals with, but as an indication of the popularity it has attained and of its usefulness to a large circle of readers. That the volume contains much less letterpress than do the more pretentious treatises is to be ascribed to conciseness of expression rather than to any omission of matter, for even a careful search reveals but few topics that are not well covered in the limited space devoted to them. It must be admitted, however, that the dismissal of the subject of arti-

ficial infant feeding is rather summary and that even a text-book on obstetrics intended primarily for students might profitably vouchsafe its readers more information on this head than is to be found in the single paragraph devoted to it. As a whole, the book is undoubtedly the most valuable shorter exposition of the subject that we have and it cannot be praised too highly for the use of students or even as a convenient reference work on practical points for practitioners.

A TEXT-BOOK OF HISTOLOGY, INCLUDING MICROSCOPIC TECHNIQUE. By A. A. BÖHM, M.D., and M. VON DAVIDOFF, M.D., of the Anatomical Institute, Munich. Edited by G. CARL HUBER, M.D., Junior Professor of Anatomy and Director of the Histological Laboratory, University of Michigan. W. B. Saunders & Co., Philadelphia.

THIS book is a translation of one of the best known German text-books on the subject of histology. For variety of information and comprehensiveness, few works are its equal. As stated by the authors in the preface in the first German edition, their aim was to present as completely as possible, both from a theoretical and practical point of view, the subject-matter of the lectures and course in histology given in the University of Munich. The examination of the work shows that the authors have amply considered the embryological basis in the most lucid and practical way; the purely morphological part is also clearly summed up and in this portion will be found the most recent contributions to the science. Thus the American editor has incorporated the recent studies of Mall on the structure of the spleen; and the nervous system has been equally developed from the standpoint of recent contributions. The value of the book is further enhanced by an excellent introductory chapter on general microscopical methods. Among the English books this takes the first place.

BOOKS RECEIVED.

The MEDICAL NEWS acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the MEDICAL NEWS will shortly appear.

THE HISTORY OF MEDICINE IN THE UNITED STATES. From the Earliest English Colonization to the Year 1800. By Dr. F. R. PACKARD. 8vo, 542 pages. Illustrated. J. B. Lippincott Company, Philadelphia and London. \$4.00.

PULMONARY CONSUMPTION, AND ALLIED DISEASES OF THE LUNGS. By Dr. THOMAS J. MAYS. 8vo, 540 pages. E. B. Treat & Company, New York. \$3.00.

INFANT-FEEDING IN ITS RELATIONS TO HEALTH AND DISEASE. By Dr. LOUIS FISCHER. 8vo, 350 pages. Illustrated. F. A. Davis Company, Philadelphia and Chicago.

A TEXT-BOOK OF DISEASES OF THE NOSE AND THROAT. By D. BRADENKYLE. Second Edition. 8vo, 650 pages. Illustrated. W. B. Saunders & Company, Philadelphia and London.